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CONTENTS

	PAGE
Editorials	225
Letters to the Editor	229
Publications Received	229
The Scrap Heap	230
Overseas Railway Affairs	231
Mechanisation of Toton Down Marshalling Yard, L.M.S.R.	233
Railway News Section	261

ELECTRIC RAILWAY TRACTION

A Supplement illustrating and describing developments in Electric Railway Traction is presented with every copy of this week's issue

Hydraulic Rail Brakes

THE marshalling of wagons by the force of gravity appears to have been first experimented with in Germany in 1846 at Dresden, and in France in 1863 near St. Etienne. It was adopted on a large scale in 1875 for the Edgehill sidings at Liverpool on the L.N.W.R., long considered a remarkable piece of work. The principle then became adopted by degrees for marshalling yards in many parts of the world and the whole subject had assumed such importance by 1895 that it was dealt with at the International Railway Congress held in London in that year. One of the great problems of gravity shunting was the prevention of collision and damage as wagons ran into the various sidings, and of ensuring at the same time that they would run as far as was desired, according to the conditions in each particular case, and so reduce to a minimum any subsequent moving that might be needed. The complexity of the problem has given rise to an enormous amount of study and the construction of numerous ingenious devices. The use of rail brakes, or retarders, was known before the war, and a hydraulic form was devised and tried by a German engineer named Losse at one or two places with a fair measure of success. Economic conditions in Germany after the war gave an impetus to trying to cut shunting costs, and rail brake and automatic point setting systems attracted great attention. The Losse apparatus came under the notice of Dr. Frölich and led to experiments being made from 1914 to 1916 with the first forms of the retarder since known by his name, in which the action is made proportional to the weight of the passing vehicle, and danger of derailment is avoided. The Frölich apparatus was later adopted at a number of places on the Continent and introduced in England at Whitemoor, L.N.E.R. The retarders at the new Toton, L.M.S.R., installation are also of this type.

* * * *

Railway Wages

This has been a week of almost continuous discussion and negotiation on the wages question. On Thursday, August 10, two meetings were held, the first between the companies and the A.S.L.E.F. to discuss the society's views on the National Staff Tribunal's rejection of its claims, coupled with the offer of the companies to raise the existing minimum wage to 45s. a week. After a discussion lasting two hours the negotiations were adjourned for a few days. Later the same day the general managers met representatives of the N.U.R. and the R.C.A. to keep them advised of the position. Last Friday the N.U.R. delegate conference, specially called, went into session and decided to affirm and press its demand for a minimum of 50s. for all adult railway workers. It was stated on behalf of the union that very strong feeling was drawn at the refusal of the companies to concede what in the opinion of the delegates was "a reasonable as well as a modest demand." It was significant that there was no suggestion that the conference rejected the companies' offer. Rather did it feel that the offer did not go far enough. On Monday last the general managers met representatives of the N.U.R. and R.C.A., and the companies' representatives emphasised that the financial position did not admit of the offer being increased. The General Secretary of the N.U.R. was reported as saying after the meeting that the position was critical. Another meeting of the special delegate conference is likely to be held soon. Meanwhile, the companies met the A.S.L.E.F. executive committee on Wednesday in the hope of finding a nationally acceptable solution of the problem.

* * * *

The Week's Traffics

Bank holiday week receipts of the four main line railways were up by £186,000 on the corresponding week last year, which did not include the holiday. The shorter working week for goods train traffic partly offset the increased passenger receipts. For the year to date the four companies have earned £99,787,000, an increase of £1,864,000 or 1·90 per cent. on 1938.

	32nd Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R. ..	+ 139,000	− 11,000	− 54,000	+ 74,000	+ 688,000	+ 1·75
L.N.E.R. ..	+ 76,000	− 9,000	− 27,000	+ 40,000	+ 448,000	+ 1·56
G.W.R. ..	+ 63,000	− 25,000	− 43,000	− 5,000	+ 613,000	+ 3·73
S.R. ..	+ 83,000	− 3,500	− 2,500	+ 77,000	+ 115,000	+ 0·85

That the 1939 traffics are on the whole below those of 1937 is shown by the following table:—

	32nd Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R. ..	+ 121,000	− 90,000	− 60,000	− 29,000	− 488,000	− 1·20
L.N.E.R. ..	+ 72,000	− 56,000	− 42,000	− 26,000	− 496,000	− 1·68
G.W.R. ..	+ 52,000	− 55,000	− 48,000	− 52,000	+ 87,000	+ 0·51
S.R. ..	+ 75,000	− 11,500	− 2,500	+ 61,000	+ 20,000	+ 0·15

Comparison with 1937 traffics to date in 1939 shows decreases of £499,000 on the passenger side and of £913,000 in merchandise, but an increase of £535,000 under coal.

* * * *

Faster Up than Down

Examination of the current timetables reveals the curious fact that the railways have a leaning towards higher speeds in the up direction than in the down. On the Great Western Railway, for example, seven of the eight fastest start-to-stop runs, including the 71·4 m.p.h. of the Cheltenham Flyer from Swindon to Paddington, are in the

up direction. On the L.M.S.R., if the trains on the London and Birmingham service—which are equally timed in both directions—be excepted, out of the 21 fastest runs using the main line between Euston and Crewe, 16 are up journeys, and again the fastest runs on the line, from Rugby to Watford at 65·1 m.p.h. and from Crewe to Euston at 64·1 m.p.h., are included. As mentioned in a recent editorial article, also, the express train service from Liverpool to London, as a whole, is considerably faster than that from London to Liverpool. On the L.N.E.R. the preponderance is not quite so marked, though of the 38 fastest journeys over various sections of the main line between King's Cross and Edinburgh, 27 are in the up direction; in this case, however, the quickest of them all and the fastest in Britain—the Coronation's 71·9 m.p.h. from King's Cross to York—is a down run. In the present British timetables there are in all twenty runs booked at over 63 m.p.h. from start to stop, and of these fifteen are in the up direction and thirteen into London.

* * * *

An Early Fare War Recalled

The earliest fare war of any national importance between British railway companies is recalled by the centenary on Saturday last (August 12) of the public opening of the Birmingham & Derby Junction Railway, whereby rail services were made possible between London, Derby, and Nottingham. For nearly a year the Birmingham & Derby Junction Railway, in conjunction with the London & Birmingham Railway which it joined at Hampton-in-Arden (Warwickshire), afforded the only rail route between London and several important centres in the Midlands, but the completion of the rival Midland Counties Railway from Derby through Leicester to Rugby on July 1, 1840, led to feverish competition for the through London traffic, in the course of which the first class fare for through London passengers over the 38½ miles from Derby to Hampton was cut from 8s. to 2s. and the second class fare from 6s. to 1s. The war ended in 1844 with the amalgamation of the rival lines, together with the North Midland Railway, to form the Midland Railway. The major portion of the original Birmingham & Derby Junction Railway now forms part of the L.M.S.R. main line between Birmingham and Derby, but the section from Whitacre to Hampton, which played such an important part in the warfare of the early forties, is now closed entirely for through traffic.

* * * *

The Railways of Luxembourg

Within the limited area of the Grand Duchy of Luxembourg there are two standard gauge railway systems—the Guillaume-Luxembourg, with 128½ miles of line and the Prince Henri, with 118½ miles—as well as 89 miles of independent metre-gauge lines. Much of the importance of the Guillaume-Luxembourg is derived from the links that it provides in through European main routes, and particularly the 18 miles from Kleinbettingen, on the Belgian frontier, through Luxembourg to Zoufftgen, on the French frontier, which is part of the main line from Brussels to Metz, Strasbourg, and Basle. There are also the 43 miles from Luxembourg through the Ardennes to Trois Vierges, providing a direct route to Liége and beyond to Amsterdam, and the 22½ miles from Luxembourg to Wasserbillig, on the German frontier, the last-named used, in conjunction with the Prince Henri Luxembourg—Rodange line, by the through Paris—Rheims—Charleville—Luxembourg—Saarbrücken services. The importance of these through connections was doubtless the chief reason why the working of the Guillaume-Luxembourg was undertaken by the Alsace-Lorraine Railways Administration, this working now coming, of course, under the direction of the French National Railways. But the Prince Henri, though suggestions were made from time to time as to taking over by the Est, with which it has maintained close relations, still preserves an independent existence.

* * * *

Portuguese Railway Company

A further serious decrease in net revenue is reported by this company for 1938, the consequence of road competition and increasing working costs. The company actually owns 1,119 km. of line, and also works 1,351 km. of the State lines taken over in 1926 (the Minho-Douro and the Sul e Sueste) as well as 50 km. worked under contract. Results for the whole system for 1938 compare with those of the previous year as follow:—

	1937	1938
Length of line, km.	2,520	2,542
Passengers, number	16,721,702	16,082,000
Goods, tons	3,567,929	3,287,000
Train kilometres	12,783,000	12,366,529
Operating ratio, per cent.	91·52	93·38
	Contos	Contos
Gross receipts	240,719	233,816
Working expenses	220,295	218,335
Net revenue	20,424	15,481

The surcharge of 10 per cent. on tariffs, authorised early in the year, proved insufficient to compensate for the decrease in traffic, attributable mainly to road competition. The number of licences for long-distance transport of goods by road has triplicated since 1934, and, moreover, the present regulations are universally ignored. Allowing for the deficit on the State lines, for 6,180 contos for rolling stock and other renewals, and for certain first charges, 9,349 contos remain for debenture service, leaving a balance of only 79 contos.

* * * *

Egyptian Delta Light Railways

Another sad tale of unrestricted road competition was told on July 28, when Sir Montagu Sharpe, K.C., presided at the annual meeting of the Egyptian Delta Light Railways Limited. He gave some significant figures to show what a serious effect uncontrolled motor services were having on the company's earnings. In fifteen years the number of passengers carried had increased from 5,800,000 to 14,000,000, but passenger receipts had fallen from £207,000 to £135,000. As far back as 1926-27 the company had felt the need for cutting down working expenses, and to this end had introduced a Sentinel engine. At the present time the management is awaiting the results of a further move towards more economy in working, namely, the introduction of twenty diesel tractors and coaches. The Egyptian Government appreciates the seriousness of the road problem and is sending a representative to confer with the railway. It is greatly to be hoped that Government co-operation will be forthcoming, for the railway, despite its shortage of cash, has tackled with enterprise that part of the problem within its own power to tackle, and given fair treatment can continue to give an efficient service to the people of the Nile Delta.

* * * *

Slip Coaches in China

From February 15, 1936, until the Japanese occupation of Canton, the slipping of coaches was practised regularly on the Canton-Kowloon Railway. The reason for the inauguration of this service is interesting. At Sheung Shui, 19½ miles from Kowloon, and in British territory, there lies the course of the Royal Hong Kong Golf Club; 2½ miles further on the Canton-Kowloon Railway crosses the Shum Chun River into China. On the principal express trains it was customary to conduct the

Chinese passport and customs formalities before the trains left Kowloon, and in using these trains to carry the golfers quickly to the course, it was desired to keep them separate from the main trains, which did not stop until they had crossed into China. The expedient of "slipping" them at Fanting station was therefore adopted; simple modifications of the standard Janney coupler in use on this railway were devised to make the operation possible; and special buffet saloon slip carriages were put into service (described in our issue of May 15, 1936). The operation was facilitated by the fact that towards Fanting there is a lengthy descending gradient. With the suspension of the service over the railway on the Chinese side of the frontier, beyond Shum Chun, owing to the Sino-Japanese war, the slip coaches have been withdrawn.

* * * *

Holidays Without Tears—by L.M.S.R.

"Holidays by L.M.S." The slogan acquires added significance now that the L.M.S.R. will not only undertake to transport the passenger to his chosen holiday resort but will also reserve hotel or boarding house accommodation and arrange sightseeing tours—in other words make the holiday a completely L.M.S. one. From Lancashire and Yorkshire towns set tours are run to Torquay for a little over £5, including return railway ticket, accommodation, conveyance from station to hotel, and specified sightseeing tours. From any station on its system, however, the L.M.S.R. will make a quotation for an "Inclusive Holiday" at a given list of places, ranging from Northern Ireland to Bournemouth, from Rothesay to Blackpool. If the centres on its list do not appeal to the prospective holidaymaker, the L.M.S.R. will work out the price of and make the arrangements for a stay at any place he likes. In the words of *Quota News*, the journal of the L.M.S.R. Commercial Department, the holidaymaker has but "to say where he wants to go and how much he is prepared to pay, and we will do the rest."

* * * *

Preserving Fruit in Transit

An experimental Italian wagon for the conveyance of fruit arrived in this country by the Southern Railway train-ferry route this week. Instead of using ice or Drikold (solid carbon dioxide), this wagon employs carbon dioxide gas to preserve the fruit. A welded steel tank of 32 cu. m., having an airtight door at each side is mounted on a four-wheel frame, and at the end of the wagon there is a small compartment containing carbon dioxide gas cylinders and a little petrol-driven compressor. As the steel tank is clothed in a wooden body, the wagon is of normal appearance. It has a tare of about 16 tons and a maximum carrying capacity of 10 tons. After the wagon has been loaded with fruit and the doors sealed, the air is evacuated and carbon dioxide gas pumped in. It is claimed that this system, which has been developed in America for the storage of apples and other fruit and is also in use in this country for the same purpose, preserves the fruit in excellent condition and is cheaper than refrigeration. If large numbers of wagons have to be dealt with it would appear unnecessary to have a compressor and cylinders for every wagon, as the process might be carried out at the loading station by means of a pipe line.

* * * *

Section Signal during Block Telegraph Breakdown

A correspondent has discussed the working of the signal giving admission to a block section which is being operated under time-interval rules, as the result of a complete breakdown of all communication with the adjacent box, such as obtained at the time of the Hatfield accident on January 26 last. He points out that Block Telegraph Regulation 25*a* (iv) contains nothing which prohibits the signalman from lowering the signal giving admission to the section, the condition of which cannot be known, after he has warned the driver and rear guard of the total failure of communication and instructed them to proceed with caution. As a clear signal normally means that the block section ahead is clear, our correspondent contends that it is inconsistent to show the same indication when no knowledge exists of the state of the line, and the passage of the last train for a certain distance is inferred only from the lapse of a certain time. He proposes that the rule should be amended to make it obligatory on the signalman to maintain the section signal at "danger" in such circumstances, the train passing it under the cautionary warning. With the installation of electric interlocking between block instruments and section signal levers—very general now on some lines—the signalman is, of course, unable to clear the signal when the block apparatus is unworkable through circuit failure, whatever the wording of the rule. In the interests of uniform working the incorporation of some such instruction as our correspondent suggests seems worthy of consideration.

* * * *

Powerful German Tank Locomotives

Results obtained with the powerful experimental 2-10-2 tank locomotives constructed for use on the Müglitz valley line of the German State Railway, and described in THE RAILWAY GAZETTE of March 13, 1936 (p. 509), are recorded by Herr Ziem in a recent number of the *Organ für die Fortschritte des Eisenbahnwesens*. These locomotives form an interesting example of special design to meet difficult conditions. Grades on the line attain 1 in 27 and there are curves of 328 ft. radius. Considerable through traffic from Dresden, with heavy winter sport and other peak periods, is experienced, and the gauge conversion from 2 ft. 5½ in. to standard, combined with extensive realignment, has enabled the journey time from Dresden to be cut substantially, and loads on the branch up to 175 *tonnes* are hauled. The design of locomotive which was found to give the best running on curves has the Schwartzkopf-Eckardt bissel truck mechanism, with side play for all but the middle coupled wheels, which are flangeless. The competing design included the Lautermöller mechanism, in which the leading and trailing coupled axles are driven from the adjacent axles by gearing. The Müglitz valley line from Heidenau to Altenberg in the Erzgebirge passes through some beautiful scenery and serves several important industries.

* * * *

The 6 ft. 2 in. Gauge

Saturday last (August 12) marked the centenary of opening of the first steam-operated railway in Ulster—the Belfast—Lisburn section of the Ulster Railway. This undertaking was promoted by Belfast business men, and incorporated on May 19, 1836, for a line from Belfast to Armagh. Originally the unusual gauge of 6 ft. 2 in. was adopted, and it was to this that the first section (and also the extension to Portadown in 1841) were built. It will be recalled that the Drummond Commission on Railway Communication in Ireland, of 1836, recommended the standardisation of the 6 ft. 2 in. gauge, but 5 ft. 3 in., now the Irish standard, was ultimately adopted. The gauge of the Ulster Railway was altered to 5 ft. 3 in. in 1849, and, in compensation for the cost of conversion, the company was awarded £13,742, leviable on certain adjoining railways that benefited by the change and the consequent possibility of through running. The original Belfast—Lisburn—Portadown line now forms part of the main line between Belfast and Dublin.

Mechanisation at Toton, L.M.S.R.

IN this issue we publish a comprehensive description of the equipment and working of the down marshalling yard at Toton sidings, L.M.S.R., which last Whitsuntide was changed over to what has come to be called mechanised working; it is the first yard on the L.M.S.R. to be so treated and local conditions have necessitated the adoption of methods somewhat different in certain respects from those obtaining at other similar yards already at work in this country. Inability to provide sufficient arrival lines in direct line of approach to the hump, on which incoming trains could stand while cut lists were prepared for the guidance of those in the control tower, has necessitated designing a substitute in the form of an electrical printing describer mechanism which records on a moving band the siding to which any particular cut has to run and the number of vehicles composing it, the hand controlled points being set by the operator from this information as the right moment arrives—the brake operator guiding his actions to suit. The actuation of the describing buttons by the observer at the hump, who notes the instructions chalked on the vehicles by the shunters, also sets the necessary electrical controls in the point controlling apparatus for magazine working of the so-called "King," "Queen," and "Jack" points, or the first, second and third leading deviation points below the hump, which thereafter function automatically as the vehicles descend. The electro-pneumatic system of working has been adopted. The rail brakes are of the hydraulic pattern, already found elsewhere in Great Britain. An interesting feature of the shunting is the use of diesel engines, which the L.M.S.R. has found very suitable for humping work. Precision speedometers enable the drivers to control their locomotives to very close speed limits, fractional speeds being indicated up to 2 m.p.h. Position-light signals, with lunar white lights, are used to advise them at what rate to propel their trains over the hump. The lighting system in the yard has been specially designed to meet fog conditions, somewhat prevalent at times in the neighbourhood, while loudspeakers and other accessories have been provided very fully, affording the maximum amount of facilities for handling the important and dense traffic which passes constantly through this key point on the railway.

The Erewash Valley line has long been one of the principal traffic routes on the former Midland Railway system, passing through the Nottinghamshire and Derbyshire coalfields and connecting with several other industrial regions of the Midlands and the South. Marshalling sidings have existed at Toton for very many years and they were considered long ago to be quite an example of how traffic should be handled at such places. Interesting reference was made to them by Frederick S. Williams in his work "Our Iron Roads," the first edition of which appeared as long ago as 1852. The author, who is perhaps better known as the historian of the Midland Railway, had the gift of writing accurately and attractively about every phase of railway working. In 1885 about 18,000 wagons a month were dealt with in the summer, or 26,000 in the winter; the shunting was almost entirely effected by horses, at least in the actual sorting lines. There were then 16 sidings, holding some 700 wagons. Notwithstanding the "clouds of fire-lit steam, the glancing lights, the white, green and red signals, the moving forms of engines, trains and men" with, in addition, "the bumping of trucks, the shouts of men and the squeals of whistles from locomotives and shunters" that writer was able to assure his readers that "cosmos reigns amidst this seeming chaos; and the multifarious and apparently bewildering transactions are carried on with order, precision and security." He even felt obliged to inform the Midland official who conducted him round that his were "the model railway sidings!" to which that gratified individual replied, "Well, they do say we manage pretty well. We had a gentleman here from a great southern railway company for a week, who made drawings of everything. We have had an engineer from the United States, another from Russia, several others from various parts of the world; and it is certain that we get safely through a deal of business." The constantly increasing traffic has, in the course of years, compelled the gradual adoption of other methods than those which were thought so satisfactory in those days, ending with the introduction of the latest apparatus of its type provided by the scientific knowledge and accumulated experience of the present time. For example, hump shunting was introduced at Toton Down side in 1901. Such visitors as may come to view the present yard, from far or near, will, we hope, find our article of material assistance in following both its layout and working; they will at least be no longer under the necessity of imitating the man from the south in the eighties and spending seven days on the site making drawings for themselves!

* * * *

The Axlebox Problem in India

THE unreliability of rolling stock bearings has caused great concern in India for many years past, and, indeed, this factor has seriously militated against the more intensive utilisation of locomotives on the Indian railways. It might be thought that the climatic and other conditions there prevailing would be held in part responsible for the difficulties met with, but investigations have shown that this is not so. It is therefore, a matter of importance that the subject should have been ventilated at a meeting of the Indian and Eastern Centre of the Institution of Locomotive Engineers at Delhi on a recent occasion, when Mr. R. C. Case, a member of that institution, read a paper entitled "Notes on Rolling Stock Bearings and Lubrication Problems." The author was well qualified to deal with the subject, having himself endeavoured to discover, by visiting European railways, the reason for the great discrepancies in bearing performance that exist in the respective territories, in spite of a close correspondence in detail design. It was sought to find an explanation for four main questions, namely: (*a*) Why European bearings should be so greatly superior in reliability to Indian bearings? (*b*) If dust and heat were the main differences, why were there no material differences in results during the Indian monsoon and dry seasons? (*c*) Why was it seldom or never possible in India definitely to establish the superiority or inferiority of various oils and white metals? (*d*) Why in general were results so erratic that it proved virtually impossible to form definite conclusions even with the help of conscientiously compiled statistics?

The large number of variables involved made it difficult to arrive at conclusive answers to these questions, and the experiences of the different railways using diverse methods, tended further to complicate matters. Transference from oil to grease lubrication on one railway gave tolerably successful results, but on another the reverse. One railway equipped certain I.R.S. type engine bogie axleboxes with water cooling, and many different kinds of bearing metals and lubrications were tried with varying degrees of success. At least one Indian railway has succeeded in obtaining a standard of reliability in oil-lubricated locomotive bearings that compares favourably with European practice, but this experience has not been shared generally by others.

The united efforts of various bodies such as the I.R.C.A. Hot-Box Standing Committee (Carriage and Wagon), the

Standing Committee of Metallurgists and Chemists, and officials in the Indian Stores Department and Government Test House, have led to conclusions which afford much-needed enlightenment as to the causes of bearing troubles on the Indian railways. These are summarised and take the form of replies to the questions previously stated. They are: (*a*) The principal cause of heated locomotive bearings is the practice of using syphon type crown-feeds in conjunction with a type of axlebox-keep which cannot conveniently be inspected or repacked. (*b*) The principal cause of wear is contamination by dust and grit. The main source of this contamination is the high ash content of the fuel burnt in the locomotives, in conjunction with defective ashpans and damping gear. (*c*) There are many details of design and practice that require alteration. (*d*) Given adequate attention to (*a*) and (*b*), there is no reason why bearing performance in India should not compare favourably with European practice. Not having had an opportunity of studying Mr. Case's paper *in extenso*, it is not possible to refer at this stage to any observations he may have made on the above conclusions, which, as they stand, present a summary of causes without at the same time suggesting what remedies should be applied to meet them.

LETTERS TO THE EDITOR

(*The Editor is not responsible for the opinions of correspondents*)

"The First Course"

The Pullman Car Co. Ltd.,
Victoria Station, Southern Railway,
London, S.W.1, August 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I notice in your issue of August 11 a paragraph entitled "The First Course" in which you, in common with some others, hold the view that *hors d'œuvres* rather than soup should "open the innings" for lunch, soup being essentially a preface to dinner.

You throw out a hint that this idea might be introduced in railway catering thereby breaking, to use your own words, "a somewhat rigid tradition."

May I be permitted to say that it has been the Pullman practice for some years to serve *hors d'œuvres* at lunch on most of the services we operate. When, more by calendar calculations than actual fact, we know that summer has come, melon and grape fruit are very often included in the lunch menu, whilst at other times recognised *hors d'œuvres* dishes are a regular feature.

Yours very truly,

C. M. SQUAREY,
Assistant General Manager

Publicity Value of Streamlining

Tasmanian Government Railways,
General Manager's Office,
Railway Department,
Hobart, July 10

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I am obliged by the receipt of a second copy of your publication for April 21 last, which contains at pages 658 and 659 pictures of our streamlined train and Sentinel Cammell cars and descriptive matter in connection therewith.

I feel that I am obliged to call attention to what can only be regarded as unfortunate editorial comment at the foot of page 638 and top of page 639, which has been written in a spirit of levity hardly in keeping with the subject and likely to bring ridicule upon the Department in its attempt to modernise its train services. The reference in the last sentence to creeping paralysis is surely uncalled for.

I would draw your attention to the reference to streamlined trains on page 766 of the issue of May 12 of your journal—

> "Actually, it is the greatly increased comfort and speed of these air-conditioned trains that is the attraction rather than the fact of their being streamlined. *The latter, however, undoubtedly has a considerable publicity value.*"

I agree with these remarks, and it was principally from the point of view of publicity that the streamlining of trains for our lines was carried out.

I very much regret having to write in the spirit of complaint, but I think you will agree, upon reflection, that the remarks contained herein are unwarranted.

Yours faithfully,

C. J. ROLLINS
General Manager

[We regret that the editorial note referred to should have given offence and offer our apologies. Reference to a letter from Mr. G. V. O. Bulkeley, then Director of Transport in the Government of Nigeria, published in our issue of June 2, reveals that he disagreed as much as the General Manager of the Tasmanian Railways with the views too jocularly expressed in our issue of May 21. As Mr. Rollins points out, streamlining has a publicity value, even at speeds lower than 70 m.p.h. at which its economical value begins to function. Quite recently the L.M.S.R. built 10 Pacific locomotives of the same class, 5 streamlined and 5 non-streamlined, but which are the handsomer is a matter of personal opinion.—ED. *R.G.*]

PUBLICATIONS RECEIVED

Checking Spur Gear Teeth : The Base Tangent and Pin Systems. By Francis W. Shaw. (*Mechanical World* Monographs). Manchester : Emmott & Co. Ltd., 31, King Street West ; London : 28, Bedford Street, Strand, W.C.2. 7¼ in. × 4¾ in. 24 pp. Paper covers. Price 1s. net.—This booklet is in two parts, explaining respectively the base tangent and the pin or roller systems of checking spur gear teeth. In both cases an account is given, with numerical examples and diagrams, of how the correct caliper settings are arrived at. In both systems, the usual formulæ have been simplified and the calculations facilitated by special tables. The handbook is produced in a convenient pocket size ; this will encourage the user to keep it handy as a practical guide and source of reference.

Year Book of the Clerks of Works Association of Great Britain, 1939-40. London : G. W. Harris, 43, Leopold Road, Harlesden, N.W.10. 6½ in. × 4 in. 130 pp. Rexine cover.—This year book has been published for the purpose of bringing the Incorporated Clerks of Works Association to the notice of architects and others who may require the services of clerks of works. The book is of convenient pocket size, and contains all the tables, formulæ, and other information likely to be required by those engaged in the building industry.

Patterns in Alloy Steels.—A new catalogue from Darwin's Limited, Sheffield, provides a useful list of case-hardening and annealing boxes, and certain other patterns, which are regularly stocked in the firm's Pireks alloy steels. An important application of these heat-resisting alloys is for furnace muffles, of which the maker supplies 32 standard patterns to the dimensions specified in the catalogue. Pyrometer tubes and salt pots are also included in the list. At the end there are some practical notes on methods of preserving the life of equipment which has to work at high temperatures.

THE SCRAP HEAP

ENGLISH COKE FOR GERMANY

On the Leipzig-Dresden Railway—the first main line in Germany—which was opened in 1839, coke was originally used as fuel. For some years this was obtained from England, but finally in 1857 coal was substituted.

* * *

MAJOR STORMONT

Major Stormont, formerly London Manager, Italian State Railways, has completed extension to his charming old hotel ("Chequers") at Pulborough, Sussex, and will be happy to welcome old personal and business friends.—*From "The Times" of August* 2.

Major Stormont (formerly London Manager, Italian State Railways) thanks those who wrote him after his announcement concerning his charming little 16th-century hotel (Chequers, Pulborough, Sussex), and is delighted at the prospect of renewing old and making new friendships.—*From "The Times" of August* 8.

* * *

LAND AND WATER-LOO

Last week in these columns reference was inadvertently made to a journey "by boat and train" from London to Southampton. In this connection, the answer to the correspondent who asks us if the soubriquet of "paddle-box" was given to certain L.S.W.R. locomotives on account of their seaworthiness, is most emphatically in the negative.

* * *

MONEY FOR JAM

With regard to the "van-ishing" trick played, without malice aforethought, by the L.N.E.R. on Scarborough holidaymakers, the statement was made in an evening paper that some of those temporarily bereft of their belongings proposed claiming damages from the company for "loss of their holiday, worry and inconvenience." If we had the good luck to lose the last two, we should feel inclined to throw in the holiday as a bonus.

* * *

Birmingham children are to have a "joy ride" express of their own to Weston-super-Mare, on the lines of the Kiddies' Express from Paddington to that resort last Whitsun Monday. The train will leave Birmingham (Snow Hill) next Monday at 10.45 a.m., with bookings from local stations in the district. During the journey the children will be entertained in a specially-constructed theatre coach and in the compartments with conjuring and ventriloquist performances. Before the journey begins, paper hats, a booklet of puzzles, and free tickets of admission to the Marine boating and bathing lake and to a special performance of the Troubadour Follies on Weston-super-Mare sands, will be distributed.

TOTON

The Erewash Valley is called after the name of the river, which first issues from a grassy bank near Kirkby, and is represented in the initial letter on the first page of this volume. The river itself is said to derive its own title of Erewash, Erwash, or Errewash, from the Cambro-British word Erwyn, the river of heroes. It separates Derbyshire and Notts; and, as the line crosses and recrosses the water, the traveller is now in the one county and now in the other. The valley and the line descend from within three or four miles of Clay Cross to the Trent station, and thus form a specially convenient incline for the loaded trains of minerals bound for the south; while, from the slopes on either hand, many tributary branch lines feed the trunk. In addition to the mining population with which the valley teems, there are numerous villages occupied by small manufacturers of hosiery and lace, who take their products to the county town, and bring back supplies of food and clothing for themselves.

One of the first of these is the large and increasing village of Long Eaton, conspicuous in which are the extensive wagon works of Mr. J. S. Claye, and the new lace factory of Messrs. Fletcher. Extending to the northward, are the numerous and commodious cottages occupied by servants of the Midland Company; and then we see the large engine stables and sidings of Toton. This is a place of almost as much importance in the working of the mineral traffic of this district as Trent station is for the passenger traffic. Here the loaded trains for the North and the empty ones from the South are marshalled for their next journey to their respective destinations; and for this service some *five and twenty miles of sidings* have been laid down.*

Extracts from Frederick S. Williams's book, "The Midland Railway—Its Rise and Progress," published in 1875.

[The Trent—Toton goods lines were authorised by the Midland Railway Act, 1899.

Toton was a flat shunting yard originally and horses were employed for shunting up to the time it was converted to gravitation shunting. There was undoubtedly a hump at the Down side in 1901.—ED. *R.G.*]

* * *

When the Imperial Airways flying boat *Cabot* left Southampton for Montreal last Saturday, she carried a shipment of fashion goods for stores of the Hudson's Bay Company in western Canada. The shipment was arranged by the Canadian National Express, which operates from coast to coast of Canada over Trans-Canada Air Lines. At Montreal the goods were transferred from the flying boat into Trans-Canada aircraft, and were in view at the stores in places as far west as Calgary, Edmonton, and Vancouver only three days after departure.

* Today there are approximately 50 miles—Up and Down sides.

* * *

HALF A CENTURY OF SOUTHERN TRAVEL

Mr. A. H. Dykes, of Shortlands, Kent, has been a traveller for 50 years on the Southern Railway and its predecessors, and a season ticket holder practically all the time. In writing to the company on another matter recently he said:—

"Will you please accept my thanks for your services during the 50 years I have been a passenger. . . . I should also like to bear testimony to the unvarying courtesy of your officials. . . . The railways serve the country well and deserve support and thanks."

* * *

Numberplate of L.N.E.R. wagon No. 8883, one of the two bound for Scarborough which were recently "lost," and eventually located in Whitemoor yard (see last week's issue)

* * *

Many new clubs for railway workers on the different lines of the Soviet Union are being built this year. Four hundred thousand roubles is the amount allocated for the completion of a club at the Sorting station on the Lenin railway, and five hundred thousand roubles will be spent in building a club at Orel on the Dzerzhinsky Railway.

* * *

"Conveyance from Manchester by Railway. Thomas Sturland begs to inform his Friends and the Public that he is prepared to forward goods by Railway, daily, from his Warehouse, Castle Field, Manchester, to Worcester; thence by North Rees's Fly Vans to Hereford, Hay, Brecon, Merthyr, Llandovery, Llandilo, Carmarthen, Cardigan, Haverfordwest, and all parts of South Wales."—*From an advertisement in the "Carmarthen Journal" of July* 21, 1839.

* * *

John Quincy Adams, President of the U.S.A., thought that the Chesapeake & Ohio Canal, which had its first stone laid on the same day (July 4, 1828) as the Baltimore & Ohio Railroad, would be of greater importance to the nation than the railroad could be, so he participated in the canal event and sent his regrets to the B. & O.

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

INDIA

Locomotive Building in India

In approving the Railway Board's proposals for examining the question of constructing broad gauge locomotives in India, the Standing Finance Committee for Railways impressed upon the board the strong public opinion in India, both inside and outside the Legislative Assembly, in favour of the manufacture of locomotives in India on the grounds of national efficiency. The committee suggested that the question should, accordingly, be examined in a broad spirit.

Rolling Stock Programme

The committee then went on to discuss the rolling stock programme for 1940-41. The total estimated expenditure, approved by the committee, is approximately Rs. 390,25,000, of which Rs. 160,75,000 are allotted for locomotives and boilers, about Rs. 96 lakhs for carriages, and about Rs. 132 lakhs for wagons.

37 Additional Locomotives for E.I.R.

The important item in respect of the expenditure on locomotives is the provision of about Rs. 64 lakhs for 37 additional engines on the East Indian Railway to cope with the increased traffic. The balance of the expenditure is largely in respect of locomotives on replacement account. In regard to boilers, provision has been made for 131, of which 23 are additions and the rest replacements. A sum of Rs. 66,33,333 has been provided for the construction of new carriages, of which nearly Rs. 50 lakhs are for intermediate and third class carriages. About Rs. 77,25,000 will be spent on the purchase of 1,550 broad gauge "general service" wagons. This number is a third of the 4,650 broad gauge general service wagons, the purchase of which during the triennium, 1940-41 to 1942-43, had already been approved by the Standing Finance Committee for Railways at its previous meeting. About Rs. 12,75,000 are to be spent on purchasing 128 broad gauge oil tank wagons, of which 42 will be additions. This includes provision for broad gauge tank wagons for an anticipated increase in the petrol and molasses traffic. The committee wished to have a note containing further detailed information as to the possibility of establishing eventually a machine tools industry in India.

Transport Advisory Council

A meeting of the Transport Advisory Council was held at Simla on July 28 with Sir Andrew Clow, Member for Railways and Communications, in the chair. Provincial delegates included many ministers; Mr. K. G. Mitchell, Consulting Engineer (Roads) with the Government of India, acted as Secretary. The principal business before the council was the consideration of the draft model rules drawn up by the technical committee of the council to form the basis of the rules to be framed by the local Governments under the Motor Vehicles Act. These rules fill in certain details left out in the Act. The council also considered the functions of the provincial boards of communications in the light of circumstances created by the new Act and rules. The technical committee was reappointed to function as before until the next meeting of the council.

Railway Statistics

As a measure of retrenchment the post of Deputy Director of Statistics on the Railway Board was abolished some years ago. The report of the Wedgwood Committee emphasised the importance of statistics and recommended that a statistical officer should be reinstated in the office of the Railway Board. This officer's duties, the committee suggested, should be to measure the effect of new policies or experiments, to co-ordinate the statistical work of the railways, and generally to afford guidance in statistical matters to the railway administrations. It is specially laid down as essential that he should possess the requisite experience and should have a status that would enable him to make the fullest use of his special qualifications. The committee considers that he should stand in his relations to the agents more as a consultant than as a critic.

Special Officer Deputed to Study English Railway Statistics

In acceptance of this recommendation, the Railway Board has placed on special duty in England Mr. H. M. Jagtiani, until recently a Deputy Director in the office of the board, to study the latest methods of preparation and interpretation of railway statistics as adopted in Europe. Mr. Jagtiani has already sailed for England where arrangements have been made by the courtesy of the Chief General Manager of the London & North Eastern Railway to afford him full facilities for a thorough study of the work of the statistical branch of the major English railways.

Mr. Jagtiani will study in detail the general, operating, and commercial statistics in addition to purely workshop and mechanical statistics. He will go into the methods employed to interpret all statistical data, the use to which they are put in practice, and also the methods employed to bring results on various divisions with differing conditions to a comparative basis one with another. Throughout his investigations, Mr. Jagtiani has to bear in mind the necessity in India for the Railway Board to gauge the results of operation of all railways and the dissimilarity in conditions which exists on many Indian railways.

On completion of his deputation, Mr. Jagtiani is to submit a report covering the whole field of railway statistics and indicate what changes and improvements are necessary in the existing Indian practices.

The work of statistical officers on the Indian railways has, hitherto, been largely confined to the compilation of figurative data, the proper interpretation of which, as a guide to the heads of departments, has not received the importance that this side of the Statistical Officer's duties deserves. It is hoped that, as a result of Mr. Jagtiani's experience abroad in modern methods, the advisory and consultative duties of the Statistical Officer will be brought more into prominence.

NEW ZEALAND

General Manager's Address at Victoria University College: Chair of Transport Proposed

In an address on "Railway Administration" at the Victoria University College recently, a suggestion that a chair of transportation should be established in the University of New Zealand was made by the General Manager of Railways, Mr. G. H. Mackley, C.M.G.

Mr. Mackley said that transport, by reason of its importance to individuals, to the community, and to the nation, was entitled to a foremost place among those subjects for which courses of studies were made available in the universities. A sound grounding in the fundamentals of transportation could be given by the establishment of a chair of transportation at one of the university colleges. He believed such chairs were by no means uncommon among the universities of the United States of America. In New Zealand such a chair would be welcomed by all connected with the administration of the Dominion's transport industry, whether sea, rail, road or air.

The Modern Outlook and Merits of Government Railways

Among other remarks made by Mr. Mackley in his address were: "The day of the railway officer who follows precedent merely because it is such, and is complacent in established practices or who dwells within the narrow confines of the branch of the department in which he was educated, is past. Acute departmentalism, as we have understood it, will have no place in the future of our railways."

Continuing, Mr. Mackley said that a small section of the community held the view that the best results had not been obtained from Government ownership and operation of railways in New Zealand and that the community value of railways would be greater

were they operated and controlled under private ownership conditions. His own view was that, having regard to the peculiar transport needs of New Zealand as a young and growing country, a wise and useful purpose had been served by having the railways organisation so controlled and administered as to permit of its giving a maximum of service in the interests of national progress and development while still maintaining the characteristics of a purely transportation enterprise; this had been possible of achievement only under the method of Government control.

New Zealand's Largest Undertaking

The railways organisation was New Zealand's largest industrial and commercial undertaking and the financial aspect of its administration one of national importance. The capital sum involved in the railways was £58,728,615, and the revenue account in the financial year just closed amounted to £9,345,387; the working expenses account was £8,644,324. This latter figure did not include an expenditure for the year within the department of £2,498,399 on capital works such as locomotives, rolling stock, track duplication, grade easements, &c. This capital expenditure was quite distinct from that of the Public Works Department on the construction of new lines.

The capital value of the rolling stock and tarpaulins in service at present was £12,000,000, including the cost of the rolling stock placed in service during the last financial year, amounting to £738,820. The approved building programme for locomotives and rolling stock represented a financial outlay of £3,802,478, including the cost of 40 locomotives and 10 railcars which were being imported this year.

CANADA

The Conservatives' Railway Policy

Dr. R. J. Manion, leader of the National Conservative Opposition, recently outlined his party's programme for dealing with the railway situation. It contained, in the first place, provision for a non-political board to enforce co-operation between the Canadian Pacific and Canadian National Railways. Other provisions were to cover compensation for jobs lost due to co-operation, a fair rate basis for all forms of transport to be secured by Dominion—Provincial co-ordination, the re-funding of C.N.R. securities at lower interest rates, exclusion of all political considerations from railway administration, and the policy of building Canada up to the railways instead of dismantling the latter.

He again declared against the unification of the two systems, which would save only £25,000,000 and not £75,000,000 as originally claimed by its sponsors. Instead, he claimed that his party's programme would effect from 75-90 per cent. of the economies possible by unification, without injustice to the employees of the railways, without building up a great monopoly, without setting up a great political machine that might control governments, and without making the Dominion responsible for the liabilities of the private company.

UNITED STATES

N.Y.C. All-coach 17-hr. Chicago Flyer, Pacemaker

Yet another *de luxe* coach express was introduced by the New York Central administration on July 28, booked to make the journey between New York and Chicago in 17 hr. Despite the special accommodation provided, the round trip fare between the two cities is only $30-90 including seat reservation. Each train in this service includes an observation-buffet-lounge car, club-buffet-lounge car, *de luxe* coaches, with individual reclining seats, a coach reserved for women and children, and dining car—serving breakfasts at 50 cents (2s.), luncheons at 65 c. (2s. 6d.), and dinners at 75 c. (3s.). Dimmed lights at night and freedom from disturbance for ticket checking; radio; the provision of magazines; and other features making for extra comfort are specialities of these trains. A 30-day return fare from Chicago to the New York World's Fair by this service costs only $28·20.

ARGENTINA

Annual Dinner of British Engineering and Transport Institutions

This dinner was held at the Plaza Hotel, Buenos Aires, on June 23, and was attended by a large number of members from the various institutions comprised in the Centre. Mr. C. R. S. Harris, Director-General, B.A.G.S. and B.A.W. Railways, presided. The specially-invited guests were Mr. C. E. S. Dodd, H.M. Chargé d'Affaires; Mr. S. E. Vaughan, O.B.E., Acting British Consul-General; Engineer Arturo Noni, Director-General of Argentine Railways; and Engineer Pablo Nogués, General Manager, Argentine State Railways. Mr. E. Millington-Drake, C.M.G., British Minister to Uruguay, and Engineer A. Vaquer, President of the Argentine Centre of Engineers, were also invited, but were unavoidably prevented from being present.

The customary toast of "Our Guests" was proposed by Mr. W. F. Nixon, Vice-Chairman of the Centre, and responded to by Mr. Dodd, who referred to the forthcoming departure for England of Mr. Harris, and said he would be greatly missed from among them. The toast of "The Centre" was proposed by Mr. Vaughan, who in voicing the regret of the gathering at the absence, owing to a family bereavement, of Mr. Millington-Drake, referred to the founding by him and Lady Effie Millington-Drake of the Inchcape Scholarships in engineering at Glasgow University for the sons of British engineers resident in Argentina. The speaker mentioned the good work done by the Centre, which, he understood, now had a membership of 800, a figure which showed the important element it represented in the British community in Argentina. The toast was responded to by the Chairman.

In referring to his impending departure, Mr. Harris said that he would leave Buenos Aires with great regret. He found it difficult to find words wherewith to express his admiration for the co-operation he had received from all sides in the tasks with which he had been confronted. He had been very proud to be their chairman, and he was glad to think that he would be returning to Argentina from time to time.

Engineer Noni, who also spoke briefly, suggested that a mixed commission, representing the Government, the railways and the road transport concerns, should be appointed for the purpose of studying Argentine transport problems. He said that although the Government was not idle in the matter, such a commission could accomplish a lot of good.

A Daring Train Robbery

The daylight robbery of a passenger train on the Rosario—Puerto Belgrano Railway, between Bahia Blanca and Rosario, was carried out on July 8. When the train stopped at Runciman station in the Province of Santa Fé, some 161 km. from Rosario, four men, armed with revolvers, held up the guards in charge of the brake-van, and then broke open the strong box, which they despoiled of its contents, amounting to some $4,000; they then decamped with their booty to a motor-car which was waiting in the vicinity in charge of two accomplices. The robbers succeeded in escaping, in spite of being fired at by some of the station staff who had witnessed the occurrence.

Heavy Wheat Exports

According to figures issued by the National Grain and Elevators Board, Argentine wheat shipments during the first four weeks, May 29 to June 25 last, amounted to 587,014 tons, the largest total registered in any month during the past two years, more than double the tonnage exported from Australia, and slightly over the aggregate tonnage from Canada and the U.S.A. during the same period. The respective totals from each of these countries were as follow:—

	Tons	Per cent.
Argentina	587,014	42·34
Canada and U.S.A. ...	561,608	40·50
Australia	237,967	17·16
Total	1,386,589	100·00

The authority quoted above gives the world's aggregate maize exports during the same period as 487,441 tons, to which Argentina contributed 415,226 tons.

MECHANISATION OF TOTON DOWN MARSHALLING YARD, L.M.S.R.

Introduction of railbrakes, power-operated points, and other modern equipment

THE London Midland & Scottish Railway brought into operation an important scheme of modernised shunting methods on Whitsun-Tuesday, May 30, 1939, when " mechanised " working began at the Toton Down marshalling yard.

There is, of course, nothing entirely new in " mechanisation " as applied to marshalling yards. Briefly the term has come to be applied to the provision of some form of remotely controlled braking of wagons and centralised control of power-operated points, with other improvements to ensure efficient working. The car-retarder yards in the United States, railbrake yards in Germany and France, rail-slipper or shoe brake yards in France, and latterly the L.N.E.R Company's Up and Down yards at Whitemoor and Inwards yard at Hull, have at one time or another been fully described and illustrated. An interesting point about the Toton scheme is that it is the first railbrake installation to be introduced on the L.M.S.R., and the first in this country where such a large yard has been converted practically *in situ*.

After studying carefully other " mechanised " yards and certain exceptional operating considerations associated with Toton Down side, the management decided that the yard should be equipped on more up-to-date lines commensurate with its importance as a traffic sorting and marshalling machine, with the object of increasing its efficiency particularly under bad weather conditions such as are frequently experienced in winter. A scheme was therefore drawn up by the company's operating and engineering officers in consultation with the General Railway Signal Company, for installing railbrakes, power-worked points, improved signalling, &c.

The amount of traffic dealt with is such that during the process of conversion it was of the utmost importance there should be no interruption of the flow of traffic through the yard, which is open continuously for six days a week, and in the height of winter has on occasions to be kept open seven days a week. It therefore became necessary to draw up stage plans and an elaborate programme whereby such constructional work as could be proceeded with clear of traffic working was performed on weekdays, whilst items involving possession of operating facilities by the engineering departments had to be done at weekends. A commencement was made in the summer of 1938 when re-alignment of the tracks in the point area was carried out at weekends, including the August Bank Holiday period. This comprised the adjustment of the layout to conform as far as practicable with one of the desirable requirements of mechanised working, *i.e.*, equal track resistance between the hump and the clearance points in the sidings.

In passing, it may be well to remind readers of the fundamental considerations of a fully mechanised yard, which are that the hump shall be of such a height and the gradient from the summit into the sidings such that the worst running wagon will run from the hump the farthest distance required into the sidings, round the sharpest curves, under the worst weather conditions. The railbrakes are provided to " take up the slack " in the good running wagons encountering the more favourable track and weather conditions and requiring to run the shorter distances to bring them to a stand or buffer up lightly with wagons already standing in a particular siding.

The re-designing and relaying of the point area involved the reclamation of many tons of old ballast, for which purpose a mechanical digger was used, and replacement by better quality ballast or chippings more suited to the efficient operation of track circuits. Other major works were carried out during Easter, 1939, and at weekends, and included the construction of railbrake pits, and the placing of the railbrakes thereon—these were covered temporarily with timber decking. The construction of the hump room and control tower, (which will be described more fully later) was begun during working hours last winter.

Previously the method of working at Toton Down yard was briefly as follows: The wagons as they descended from the hump were " steadied " as necessary by shunters applying the hand brakes on the sides of the wagons, and the points leading into the sorting sidings were operated mechanically from small elevated cabins. Consequently only at the very last stage could the hump be raised to the requisite height (a lift of 3 ft. was necessary) and the railbrakes and points connected to the power supply. Arrangements were therefore made for these items to be carried out at Whitsuntide, 1939—the engineering departments having the necessary possession from midnight Saturday, May 27, to 6.0 a.m. Tuesday, May 30. Testing was carried out on Whitsun-Monday, May 29, and mechanised working brought into operation as from 6.0 a.m. Whitsun-Tuesday, May 30, 1939. That the whole of the constructional work was completed according to schedule and without serious upset to traffic operations throughout the whole period, is no small tribute to the efficiency of the planning and the collaboration between the Operating and Engineering Departments, as well as with the contractors and sub-contractors concerned.

Before proceeding with a detailed account of the various modernised features introduced, a general description of the working and traffic operating considerations is given below.

Location and Flow of Traffic

Toton sidings are situated between Long Eaton and Stapleford and Sandiacre stations at the southern extremity of the Erewash Valley line. This line, which passes through the Nottinghamshire and Derbyshire coalfield between Trent and Chesterfield, was an important section of the former Midland Railway and forms part of one of the main trunk routes between London and the North, as shown in the positional diagram, Fig. 1.

The sidings comprise two marshalling yards, one on the up side of the main line and one on the down side. The Up yard is used as an assembling point for wagons conveying coal from Nottinghamshire, Derbyshire, and South Yorkshire collieries, and as a sorting and despatching point mainly to London and the South, Birmingham and the West, Peterborough and the Eastern Counties. The Down yard is used principally for sorting empty mineral wagons in the reverse direction, *en route* to the collieries.

On the down side there is a large motive power depot, which was modernised some years ago, and on the up side are wagon repair shops belonging to the company. Located on the down side is the Toton District Control Office—one of the original centres established by the former Mid-

land Railway Company under its " control " system for the control of traffic operations in the district.

The working into and out of Toton on the North side is largely of a comparatively short distance kind, consisting of feeding the collieries with empty wagons and lifting the loaded wagons therefrom, but the working on the south side comprises a large proportion of long distance traffic conveyed on through trains—coal to the L.M.S.R. marshalling yards in London, Wellingborough, Birmingham, Gloucester, Peterborough, &c., and similarly through trains of empties from those yards to Toton. Obviously therefore Toton is an important pivotal point and the working of the yard is essentially associated with the main line operation of a very large portion of the Midland Division of the L.M.S.R. Thus main-line delays re-act on the working at Toton, and inefficient operation at that yard re-acts detrimentally on main-line working. Apart, however, from mentioning that both the Up and Down yards are worked on the hump principle. this article will deal only with the " Down " or " Empty " side.

Approach to Down Yard

The multi-directional flow of incoming traffic can best be followed by reference to the diagram, Fig. 2, showing junctions in the vicinity, and from the following description. Approximately two-thirds of the traffic arrives on trains which enter the Down side in the direct line of approach to the hump *via* Toton East junction and what are known as the " High Level " arrival lines which cross over the Trent—Chesterfield main running lines. The remaining one-third of the traffic arrives on trains which approach Toton *via* the Trent—Chesterfield main lines and are backed in to what are known as the " Low Level " reception lines situated between the Down sorting sidings and the main line—these trains being then drawn up on to the " High Level " arrival lines *via* a hump avoiding line preparatory to humping.

Trains entering the " High Level " direct, and thereby avoiding the busy main passenger lines, comprise:—

(*a*) Those from London and the South which travel on the Trent—Toton goods lines from Ratcliffe junction.

(*b*) Those from the Nottingham direction which pass on to the Trent—Toton goods lines at Meadow Lane junction.

(*c*) Trips (amounting to approximately 10 daily) from the Up yard to the Down yard, which are drawn from the Up yard on the goods lines to Toton East junction and propelled on to the " High Level " arrival lines.

Trains arriving *via* the " Low Level " include:—

(*d*) Those from Derby, Birmingham, and the West which travel *via* Sheet Stores junction and the Trent—Chesterfield main lines.

(*e*) Certain local trips.

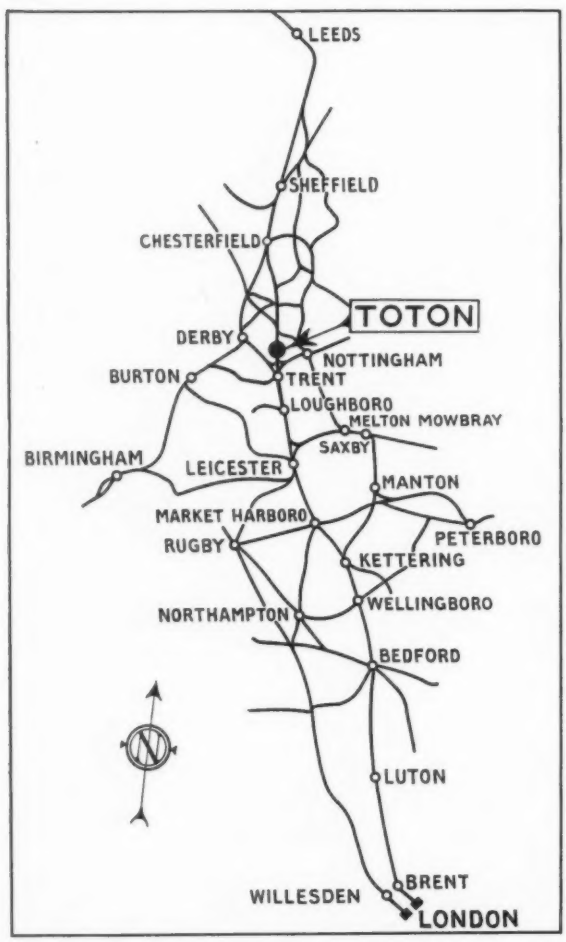


Fig. 1. Toton—Positional diagram in relation to main lines

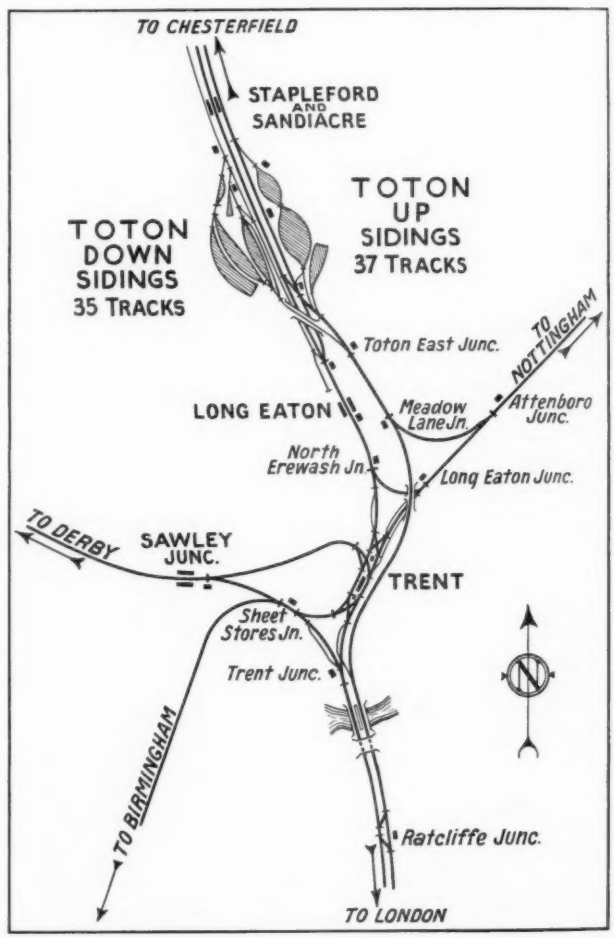


Fig. 2. Toton—Local positional diagram showing junctions in vicinity

Amount of Traffic

The quantity of traffic dealt with through the yard is very considerable. The incoming trains amount to some 60 daily in summer and 70 in winter, and include a number hauled by Garratt and Class 8F 2-8-0 locomotives frequently conveying up to 90 wagons.

A measure of the amount of traffic may be gathered from the fact that anything from 3,000 wagons (according to the day of the week) up to 5,000 wagons (on peak winter days) have passed over the single line hump in 24 hours. Since mechanised working began, over 1,600 wagons have been humped in one 8-hour shift on two separate occasions. Most of the wagons are coal empties belonging to many different private owners, including colliery companies, coal merchants and factors, wagon hirers, and public utility undertakings, and are for numerous destinations. The incidence of marshalling of the incoming trains results in the number of wagons a cut averaging very little over 1½.

Arrival Accommodation

Toton Down side was originally a flat shunting yard, and 40 years ago horses were employed for shunting; it was converted into a hump yard in 1901. Alterations and additions have in the course of time been made in the layout, but the approach and environment have prevented the development of the ideal layout which adequate space and available ground would have permitted. A single line diagram showing the whole of the present layout of the Down side is given in Fig. 3.

As there are only two "High Level" arrival lines known as "West" and "East" respectively, the former is normally used for trains approaching *via* Toton East junction and the latter for drawing up trains from the "Low Level" and as a run-round road to enable the hump engine to get behind a train on the "West" arrival line preparatory to propelling it over the hump. It will therefore be appreciated that prompt clearance of trains is of paramount importance if train engines of succeeding trains are not to be held up waiting one behind another to enter the arrival roads. There are two dead-end shunting necks to the west of the West arrival line, which are used for special purposes, but they are too short to accommodate long draws and are incapable of being lengthened.

One of the fundamental principles associated with mechanised yard working as hitherto understood is the provision of sufficient arrival lines in direct line of approach to the hump, on which arriving trains stand whilst a "cut list," *i.e.*, a list showing in sequence the number of the sorting siding for which each wagon is destined and the number of wagons in each "cut" is prepared for the information of the yard staff operating the points and the rail-brakes. It will be appreciated, however, that the compilation of such "cut lists" cannot be introduced at Toton Down side, as trains approaching *via* Toton East junction would have to stand one behind the other whilst the shunters walked along the train, compiled the cut lists and distributed the copies to the yard staff, during which time it would not be possible to liberate the train engines. Similarly "Low Level" trains could not be held up for the purpose.

Obviously one of the first problems examined when mechanisation was being considered was to see whether additional arrival lines could be provided. Not only would the construction of an adequate number of suitable length be impracticable owing to physical limitations, but the cost of providing any extra, however few, would be considerable owing to the bridging required. Special measures to overcome what would hitherto have been regarded as a disability in marshalling yard mechanisation schemes had therefore to be devised to provide a substitute for the "cut list." These take the form of an apparatus of the teleprinter variety, described later.

Method of Working

Train engines after being uncoupled from trains arriving *via* Toton East, on the "High Level," proceed over the hump to the motive power depot *via* No. 19 siding which is reserved for this purpose as this is the quickest practicable means of reaching the depot promptly. Engines liberated from trains arriving *via* the "Low Level" are already in close proximity to the motive power depot.

Two shunting engines are employed continuously throughout the year at the hump end of the yard, with an extra engine during the heavy winter months when required. A scissors crossing between the East and West "High Level" arrival lines and the hump permits of trains being humped off either line and also of trains from the "Low Level" being drawn by one or other of the hump engines on to either arrival line. Immediately on the yard side of the hump summit is a hump engine release line which permits the hump engine after humping a train to proceed direct to the "Low Level" for drawing a train up to the "High Level" *via* the hump avoiding line. The hump engine is then in position to start humping directly the signal is given.

There are 34 sorting sidings, in addition to one through road (No. 19) which, as explained, is used for sending train engines to the motive power depot. The sidings, as will be seen from the plan of the yard, Fig. 3, are in four main groups; Nos. 1 and 2 are widely separated from Nos. 3 and 4 towards the north end owing to developments of former years and the location of the motive power depot, district control and yard offices.

The sorting sidings are classified in the usual way for the necessary destinations and altered from time to time to meet traffic requirements; some idea of the character of the traffic will be gained from the following:—

No. of Siding	Classification
1.	Stowage sidings.
2.	Wait orders.
3.	Blackwell.
4.	Common users.
5.	Kirkby area.
6.	Kirkby area.
7.	Swanwick ; Brands.
8.	Pinxton ; Langton.
9.	Riddings ; Codnor Park.
10.	Stanton Gate.
11.	Cossall ; West Hallam, Trowell ; Ilkeston.
12.	Bennerley ; Manners.
13.	Coates Park ; New Birchwood ; Pye Bridge.
14.	Heanor Junction.
15.	Langley Mill and Heanor Town.
16.	Shipley.
17.	Sandiacre.
18.	Cory's works.
19.	Engine line.
20.	Toton Up sidings.
21.	End-door wagons.
22.	Roundwood ; Kilnhurst.
23.	Seymour.
24.	Summit sidings and Toton loco. coal.
25.	Masboro' area.
26.	Eckington ; Birley.
27.	Treeton.
28.	Central Division empties.
29.	Wharncliffe ; Wincobank ; Chapeltown.
30.	Avenue.
31.	Carlton Exchange.
32.	Clay Cross.
33.	Carlton Association Collieries.
34.	Normanton North yard.
35.	Leeds.

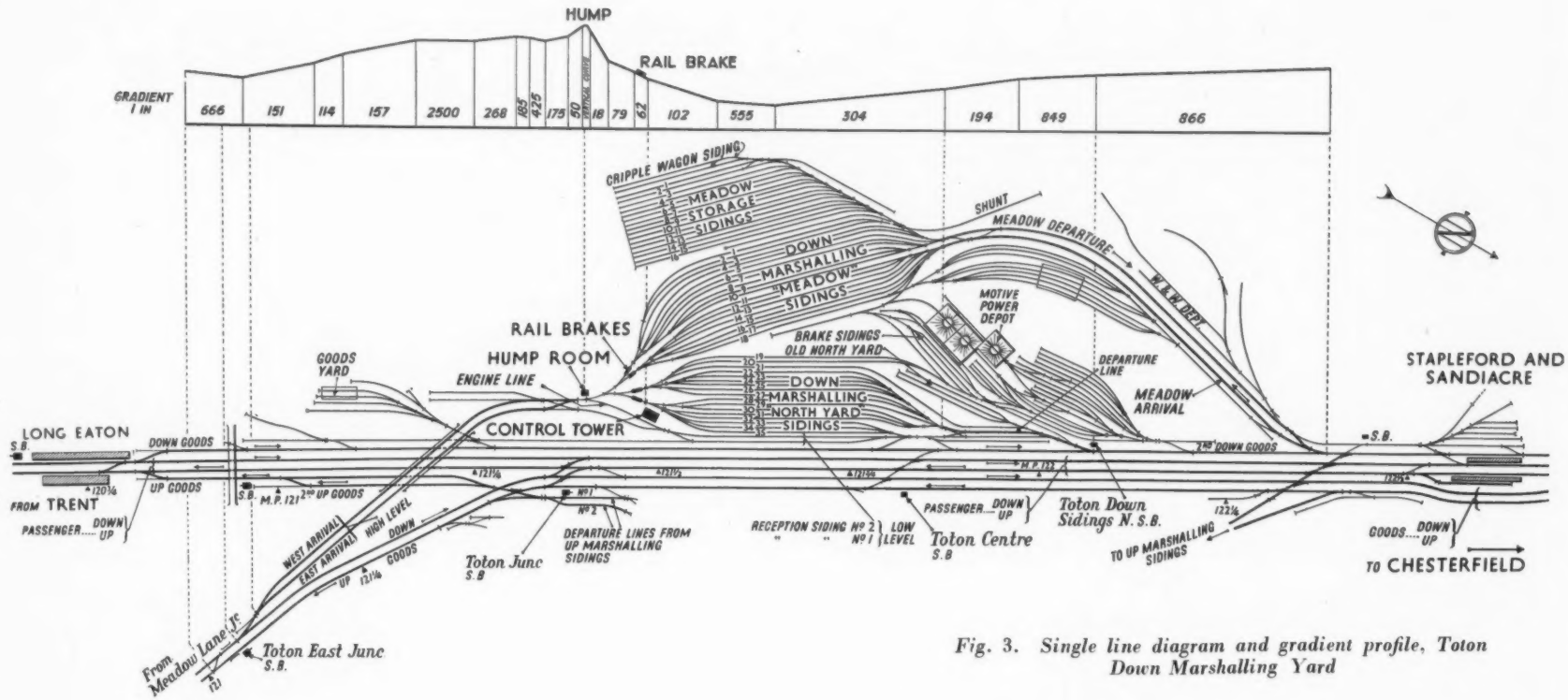


Fig. 3. Single line diagram and gradient profile, Toton Down Marshalling Yard

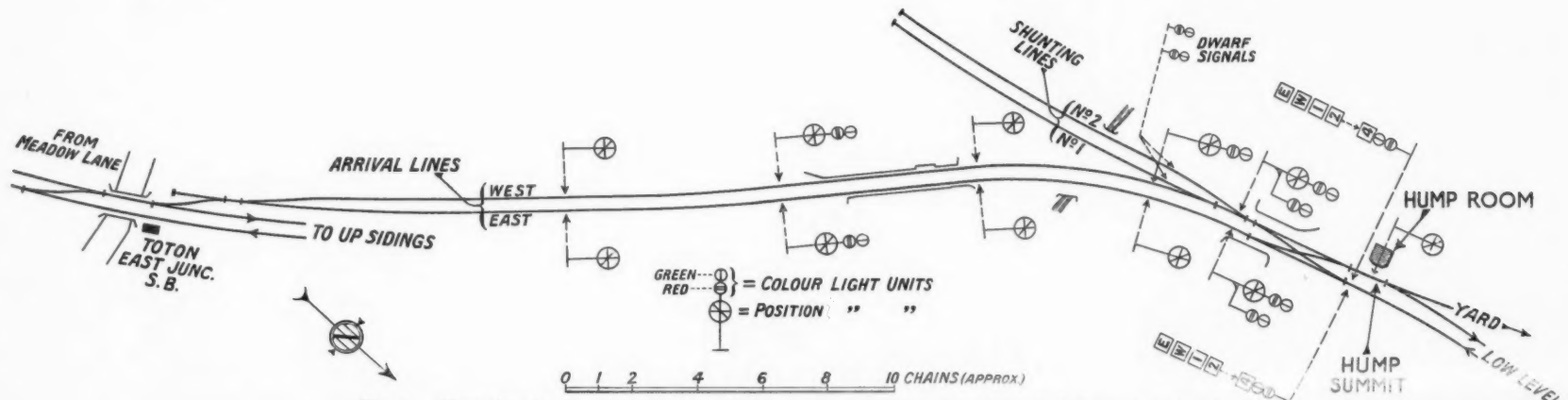


Fig. 4. Plan showing location of colour-light running signals and position-light humping signals

Immediately on arrival of a train on the " High Level " a shunter walks alongside and chalks on the end of each cut, *i.e.*, the end nearest the hump, the appropriate siding number, according to the destination label. As soon as the signal is given to begin humping, another shunter uncouples between the cuts with a shunting pole.

Design of Hump

Although the preponderance of traffic dealt with consists of empty mineral wagons, a certain amount of loaded traffic passes through the yard, such as ironstone. The variation in the running characteristics of different classes of wagon is a problem which affects all hump shunting yards, but the most marked differences are found between those equipped with oil axleboxes and grease axleboxes respectively, since the former are generally better running vehicles. As the two types of wagon arrive interspersed on incoming trains, the oil axlebox or good running wagons have a tendency during their descent from the hump into the sorting sidings to overtake those equipped with grease axleboxes, particularly in cold weather, and this is noticeably the case with empty vehicles.

As strong winds tends to slow down unduly the rate of humping, particularly empty wagons, a windscreen was erected experimentally some years ago. The windscreen which formed the subject of scientific tests, was of lattice timber construction, and proved beneficial. As, however, the height of the hump under mechanised working is such as to cater for all classes of wagons under all climatic conditions, the need for a windscreen is now less pronounced, and a portion of it has been removed under mechanised working conditions in order to give better visibility.

Apart from heightening the hump, comparatively little adjustment of gradients has been found necessary in converting the yard. The levels will be seen from the plan, Fig. 3, and the principal gradients are as under:—

1 in 50 rising (for a short distance approaching the hump).
A 10 chain vertical curve (at the hump summit).
1 in 18 falling (between the hump and the first points).
1 in 72 falling (thence through the railbrakes).
1 in 102 falling (which eases out into a saucer like formation in the sorting sidings).

A feature designed to ensure stability of the hump and maintain the correct vertical curvature is the embedding of transverse concrete blocks, the upper sides being about 1 foot below the surface ballasting.

New Structures

A new building known as the Toton Down sidings hump room is provided on the west side of and immediately opposite the hump summit. This structure has taken the place of a combined signalman's and pointsman's cabin (Toton No. 1), and its functions which embody features uncommon to a mechanised or other yard are described later. An office for the Yard Inspector (one is employed on each turn of duty) is provided in the same structure.

Another new building known as Toton Down Sidings control tower is provided on the east side of the yard near the railbrakes, and displaces three separate pointsmen's cabins Nos. 2, 3, and 4, in addition to enabling the braking control to be centralised. A more detailed description appears under the appropriate heading later.

Running Signals

The former semaphore signals on the East and West arrival lines applicable to incoming trains approaching the hump, also to light engine and other movements in the hump area, except actual humping, have been abolished and superseded by red and green colour light signals operated by switches on a panel in the hump room.

The signals controlling actual humping movements are described under the next heading.

Humping Signals

Prior to mechanisation, humping movements were controlled by a semaphore signal situate near the top of the hump, supplemented by a klaxon horn and an electric bell on the respective " High Level " arrival lines for use in foggy weather. This signal has been superseded by a much more efficient system of lunar-white position-light signals, also controlled from the hump room. These signals give the following aspects:—

(*a*)	Vertical ..	Hump at normal speed	O O O
(*b*)	Inclined ..	Hump slow	O O O
(*c*)	Horizontal	Stop	O O O

A series of these position-light humping signals is located at intervals along the west side of the West arrival line. Another series of these signals is located at intervals along the east side of the East arrival line. The last position-light humping signal to be observed from either arrival line is one on the roof of the hump room and operates in conjunction with whichever series, *i.e.*, East or West, is in use during a particular humping movement. The plan shown in Fig. 4 illustrates the layout of both the position-light humping signals and the colour-light running signals.

During normal humping operations the position-light signals can in emergency be placed to " stop " direct from the control tower also. When not in use, *i.e.*, in between actual humping movements, the position-light humping signals are switched out.

The position-light humping signals apply only to drivers of engines actually humping trains, with the exception described in the following instruction:—

> " Drivers of engines drawing wagons on to the East or West arrival lines from the " Low Level " reception lines preparatory to humping, or from the Down sorting sidings back over the hump for re-shunting, will be required to observe the position-light signals applicable to the particular arrival line, and must be prepared to come to a stand when the signal indicates " stop " (horizontal aspect), which will be an indication that the last wagon is clear of the south end of the scissors crossing situated on the south side of the hump."

After the running signal is given for a drawing up movement from the " Low " to the " High Level," the appropriate series (East or West) of position-light signals is switched to " stop " by the operator in the hump room, but a track circuit at the south end of the scissors crossing shown on the plan (Fig. 5) when occupied, switches the position-light signal " out," and as soon as the track circuit is no longer occupied, *i.e.*, when the last wagon of a draw is clear of the scissors crossing referred to, the signal indicates the horizontal or " stop " aspect. It is then switched to " hump normal " or " hump slow " by the operator in the hump room as soon as humping can be commenced. This supplementary use of the position-light signals overcomes a disability formerly experienced by drivers of engines drawing trains up from the " Low " to the " High Level," as it was difficult, and in certain circumstances impossible, for them to determine when the

Fig. 4. Plan showing location of colour-light running signals and position-light humping signals

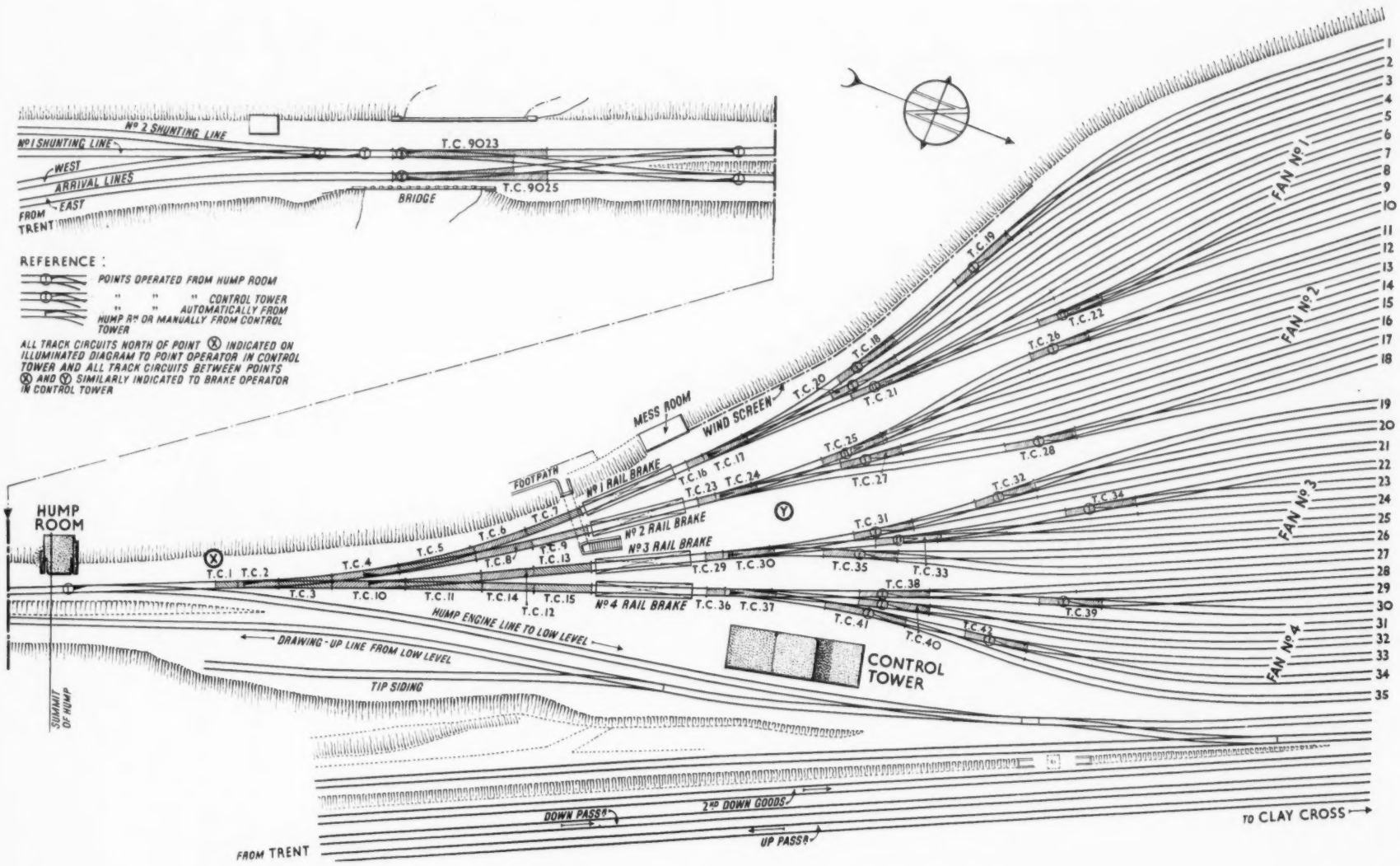

No 2 SHUNTING LINE
No 1 SHUNTING LINE
WEST
ARRIVAL LINES
EAST
FROM TRENT
T.C. 9023
T.C. 9025
BRIDGE
REFERENCE :
POINTS OPERATED FROM HUMP ROOM
" " " CONTROL TOWER
" " " AUTOMATICALLY FROM HUMP Rm OR MANUALLY FROM CONTROL TOWER
ALL TRACK CIRCUITS NORTH OF POINT (X) INDICATED ON ILLUMINATED DIAGRAM TO POINT OPERATOR IN CONTROL TOWER AND ALL TRACK CIRCUITS BETWEEN POINTS (X) AND (Y) SIMILARLY INDICATED TO BRAKE OPERATOR IN CONTROL TOWER
MESS ROOM
WIND SCREEN
FOOTPATH
HUMP ROOM
No 1 RAIL BRAKE
No 2 RAIL BRAKE
No 3 RAIL BRAKE
No 4 RAIL BRAKE
T.C.1 T.C.2 T.C.3 T.C.4 T.C.5 T.C.6 T.C.7 T.C.8 T.C.9 T.C.10 T.C.11 T.C.12 T.C.13 T.C.14 T.C.15 T.C.16 T.C.17 T.C.18 T.C.19 T.C.20 T.C.21 T.C.22 T.C.23 T.C.24 T.C.25 T.C.26 T.C.27 T.C.28 T.C.29 T.C.30 T.C.31 T.C.32 T.C.33 T.C.34 T.C.35 T.C.36 T.C.37 T.C.38 T.C.39 T.C.40 T.C.41 T.C.42 T.C.43
FAN No 1
FAN No 2
FAN No 3
FAN No 4
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
HUMP ENGINE LINE TO LOW LEVEL
DRAWING-UP LINE FROM LOW LEVEL
TIP SIDING
SUMMIT OF HUMP
CONTROL TOWER
DOWN PASS
2nd DOWN GOODS
UP PASS
FROM TRENT
TO CLAY CROSS

Fig. 5. Plan of layout in hump and point areas, Toton Down Marshalling Yard

last wagon was clear of the scissors crossing mentioned. Under the new arrangement no time is lost in drawing ahead for an unnecessarily long distance.

Both the colour-light running signals and the position-light humping signals are sighted at driver's eye-level, and provide a greatly improved means of control of operations than the former method.

Point Operation

Fig. 5 illustrates the area involved in remodelling the layout. All the points in the hump area and in the yard (except at the outgoing or north end) are electro-pneumatically operated. The following points are normally operated from the hump room under an electrical storage and track circuit or " route setting " system:—

	For convenience these are referred to respectively as the
(A) The first points into the sorting sidings	" King "
(B) The next two sets of points	" Queen "
(C) The next four sets of points	" Jack " points

N.B.—The points referred to under " C " (" Jack " points) are of the three-throw type.

The remainder of the points leading into the yard north of the " Jack " points are operated from the control tower. When necessary the " King," " Queen," and " Jack " points can be operated individually from the control tower.

Under normal humping conditions, the " King," " Queen," and " Jack " points work automatically in accordance with the order of depression of push buttons in the hump room as described under the next heading. The method of point operation is therefore partly of the " route-setting " type and partly individual operation.

Hump Room

The hump room, which is of re-inforced concrete construction, was specially designed to meet the exceptional conditions due to the undesirability of keeping trains standing one behind another for the compilation of cut lists for an entire train and a plan showing the layout is given in Fig. 6.

It consists of a room with a large bay window close to the hump summit, from which an operator observes the chalked siding numbers placed on the wagons by shunters on the arrival lines, and as the cuts of wagons pass by and separate on the hump summit, the operator depresses the corresponding numbered buttons on a panel. The depression of one of these numbered siding buttons performs two distinct functions, namely:—

(1)—Pre-sets or stores by means of an electrical relay system the route *via* the " King," " Queen," and " Jack " points.

(2)—Causes the siding number for which the wagon or cut of wagons is destined, to be printed in type on a moving paper band in front of the rail brake operator and the point operator (responsible for working the points beyond the " Jack " points) in the control tower.

Thus the brake and point operators in the control tower have before them a moving cut list showing the wagons or cuts in transit between the hump and the sorting sidings at any time.

Ancillary to the route setting and siding indication referred to, another series of push buttons is provided on the panel in the hump room, giving the " number of wagons in cut " which information appears on the moving paper in front of the brake and point operators in the control tower. These buttons are numbered 1 to 6, the latter being the limit decided upon for the number of wagons in any one cut, when automatic working as described above is in operation. Included on the panel is a button for announcing non-retarders, *i.e.*, wagons to which the railbrakes must not be applied and which are humped singly. A switch on the panel permits of the " wagons in cut " buttons being switched out if for any reason it is desired to work under " cut not described " conditions. The same panel also accommodates the switches operating the position-light humping signals, since it is desirable that the individual responsible for route-setting and transmitting siding numbers shall have direct control of humping movement. A diagram of the hump room route-setting and cut indicating panel is shown in Fig. 7.

A continuation panel at the right-hand side accommodates the switches operating the colour-light running signals and the power worked points in the hump area other than those leading to the sorting sidings. This panel incorporates an illuminated diagram, copy of which, with explanatory notes is given in Fig. 8. Further to the right is a telephone keyboard, so that the whole of the switches and buttons are mounted on one cabinet.

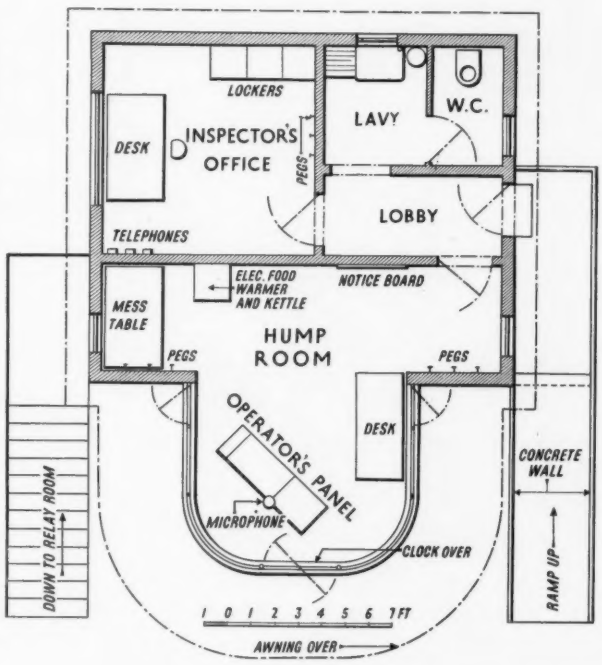


Fig. 6. Plan of hump room building

All records are concentrated in this room which is equipped with subdued electric lighting for night work, thermostatic heating by means of a gas-fired boiler in the basement, and electric food warmer, &c. Loud-speaker communication as described elsewhere is also provided, with a microphone mounted on the panel. The basement comprises an electrical relay room and a compartment for the gas-fired heating boiler.

Control Tower

The control tower is a re-inforced concrete structure, designed on somewhat similar lines to the L.N.E.R. Company's control tower at its mechanised Hull Inwards yard, and is located on the east side of the point area. It consists of three floors allocated as follow:—

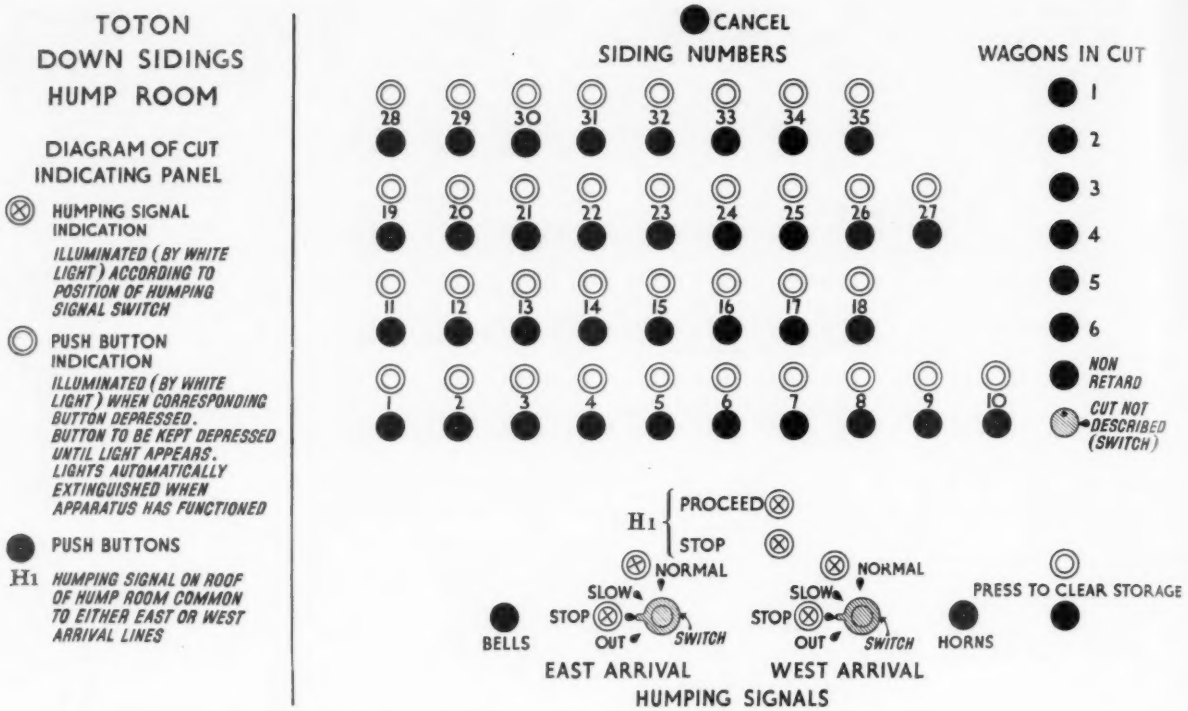

TOTON
DOWN SIDINGS
HUMP ROOM
DIAGRAM OF CUT
INDICATING PANEL
HUMPING SIGNAL INDICATION
ILLUMINATED (BY WHITE LIGHT) ACCORDING TO POSITION OF HUMPING SIGNAL SWITCH
PUSH BUTTON INDICATION
ILLUMINATED (BY WHITE LIGHT) WHEN CORRESPONDING BUTTON DEPRESSED. BUTTON TO BE KEPT DEPRESSED UNTIL LIGHT APPEARS. LIGHTS AUTOMATICALLY EXTINGUISHED WHEN APPARATUS HAS FUNCTIONED
PUSH BUTTONS
H1 HUMPING SIGNAL ON ROOF OF HUMP ROOM COMMON TO EITHER EAST OR WEST ARRIVAL LINES
CANCEL
SIDING NUMBERS
28 29 30 31 32 33 34 35
19 20 21 22 23 24 25 26 27
11 12 13 14 15 16 17 18
1 2 3 4 5 6 7 8 9 10
WAGONS IN CUT
1 2 3 4 5 6
NON RETARD
CUT NOT DESCRIBED (SWITCH)
H1 PROCEED
STOP
NORMAL
SLOW
STOP
OUT
SWITCH
BELLS
HORNS
PRESS TO CLEAR STORAGE
EAST ARRIVAL
WEST ARRIVAL
HUMPING SIGNALS

Fig. 7. Diagram of route setting and cut indication panel in hump room

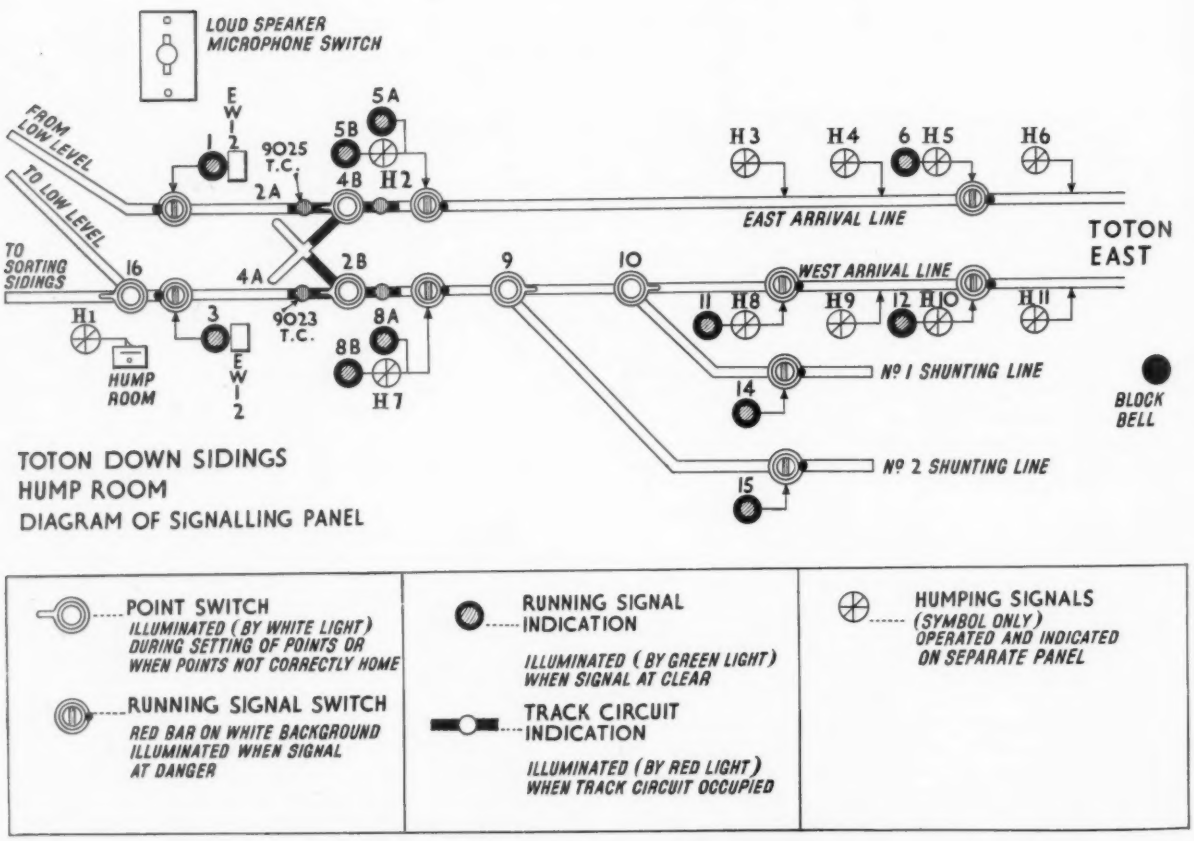


Fig. 8. Diagram of signalling panel in hump room

(a) *Ground floor.*
Hydraulic machinery room.
Compressed air plant room.
Electrical switchgear room.
Fitters and linemen's workroom.
Fitters and linemen's messroom.
Gas fired boiler room.

(b) *First floor.*
Relay room.

(c) *Second floor.*
Operating room.
Lavatory, &c.

A plan of the building is given in Fig. 9. The operating room on the second floor—generally referred to as the control tower—accommodates the staff responsible for operating:—

(i) the railbrakes,

(ii) the points leading into the sorting sidings.

Visibility of the entire yard is provided from this room by means of ample glazing. On the left hand side of the room facing the yard is the railbrake operator's cabinet in which are fitted levers for operating the four railbrakes with corresponding pressure gauges. In the middle of the cabinet is an aperture through which passes the moving paper cut list. Also on the top of the panel is an illuminated track circuit diagram of that portion of the layout between the " King " points and the railbrakes. This is provided to be of assistance in foggy weather or when visibility is poor.

On the right hand side of the room facing the yard is the point operator's panel and a diagram of this is shown in Fig. 10, together with a brief description of the functions of the various buttons and switches. The panel is based on a sidings diagram, with switches for operating the points. Transit lights in the switches are illuminated as wagons pass on the respective point track circuits and correspondence lights illuminate in conformity with the point detection.

Switches are provided to allow for either " automatic " or " non-automatic " working of the " King," " Queen," or " Jack " points, and for placing the humping signals direct to " stop." An interesting feature is the provision of " stepping " push buttons in conjunction with the " King " and " Jack " points, so that in the event of a wagon or cut of wagons overtaking another on the track circuits associated with these points, the correct sequence of the following cuts can be maintained. In the centre of the panel is the moving paper cut list and at the back a loud-speaker microphone.

Thermostatic heating of the entire building is provided by radiators fed from a gas fired boiler, and subdued lighting is installed for night work. Modern messing facilities are also provided.

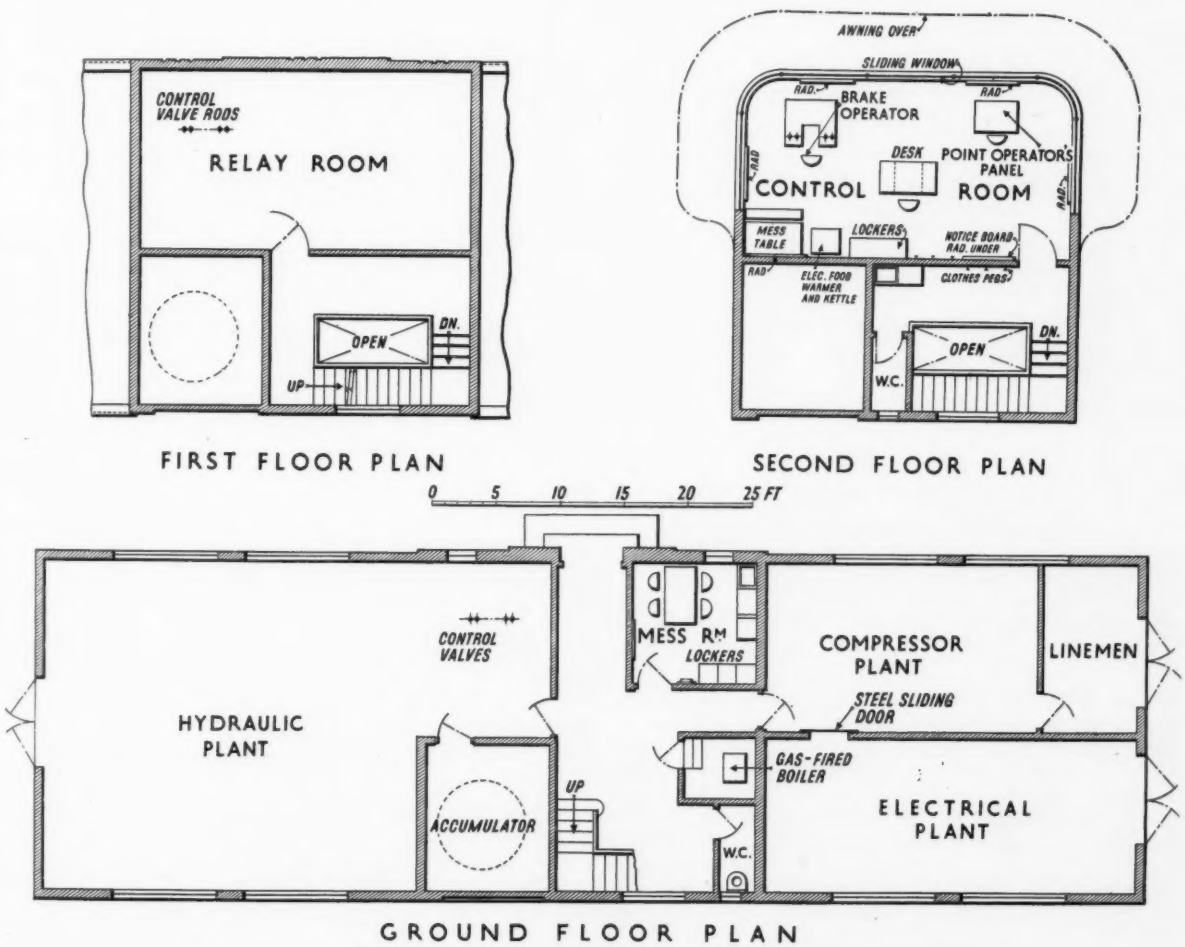
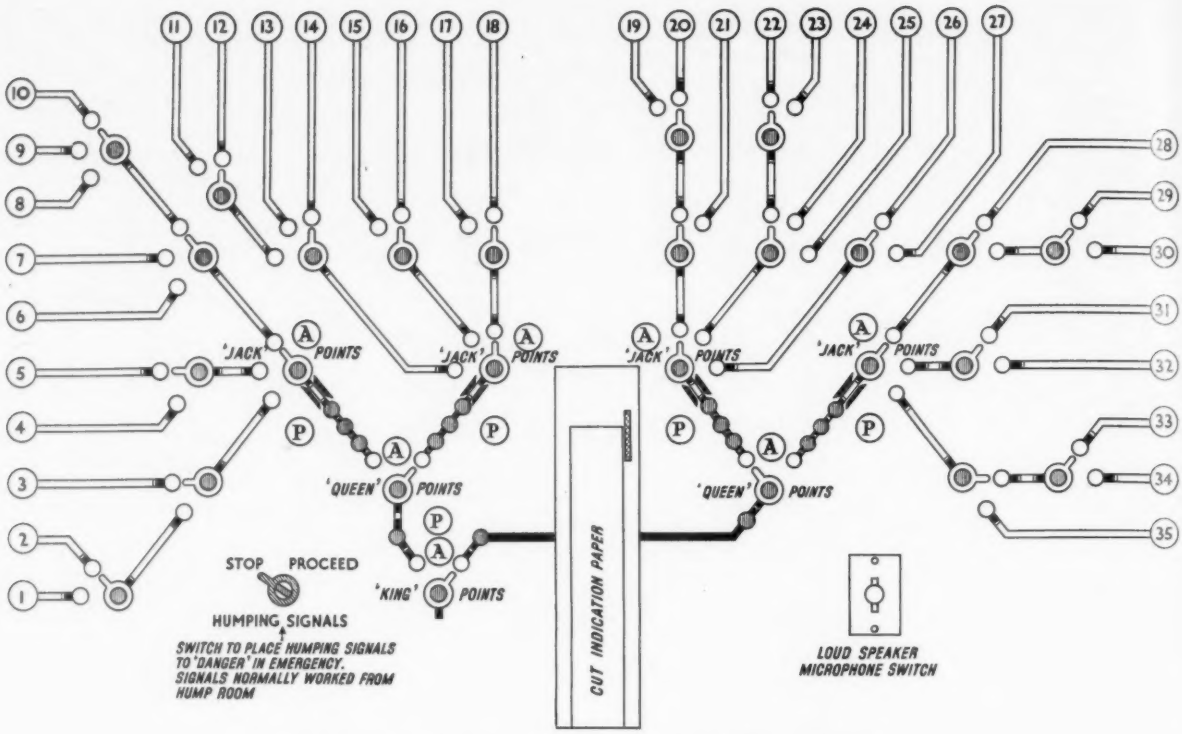


Fig. 9. Plans of control tower


11 12 13 14 15 16 17 18
19 20 21 22 23 24 25 26 27
10 9 8 7 6 5 4 3 2 1
28 29 30 31 32 33 34 35
'JACK' POINTS
'QUEEN' POINTS
'KING' POINTS
STOP PROCEED
HUMPING SIGNALS
SWITCH TO PLACE HUMPING SIGNALS TO 'DANGER' IN EMERGENCY. SIGNALS NORMALLY WORKED FROM HUMP ROOM
CUT INDICATION PAPER
LOUD SPEAKER MICROPHONE SWITCH

TOTON DOWN SIDINGS CONTROL TOWER
DIAGRAM OF POINT OPERATOR'S PANEL

TRACK CIRCUIT — *ILLUMINATED (BY RED LIGHT) WHEN TRACK CIRCUIT OCCUPIED*

POINT SWITCH — *ILLUMINATED (BY RED LIGHT) WHEN POINT TRACK CIRCUIT OCCUPIED*

POINT MOVEMENT INDICATION — *ILLUMINATED (BY WHITE LIGHT) SHOWING THE POSITION OF THE POINTS*

(A) AUTOMATIC POINT OPERATION — *WHEN 'KING', 'QUEEN', AND 'JACK' POINT SWITCHES ARE POINTED TO A AUTOMATIC WORKING OF THESE POINTS IS IN OPERATION FROM THE HUMP ROOM*

(P) STEPPING PUSH BUTTON — *IN THE EVENT OF ONE WAGON OR ONE CUT OF WAGONS OVERTAKING ANOTHER ON THE TRACK CIRCUIT OF EITHER THE 'KING' OR 'JACK' POINTS WHILE AUTOMATIC WORKING IS IN OPERATION, THE CORRESPONDING PUSH BUTTON P MUST BE PRESSED ONCE, TO CLEAR THE FIRST WAGON OR CUT OF WAGONS FROM THE AUTOMATIC STORAGE IN ORDER TO MAINTAIN THE CORRECT SEQUENCE OF THE FOLLOWING CUTS*

Fig. 10. Diagram of point operator's panel in control tower

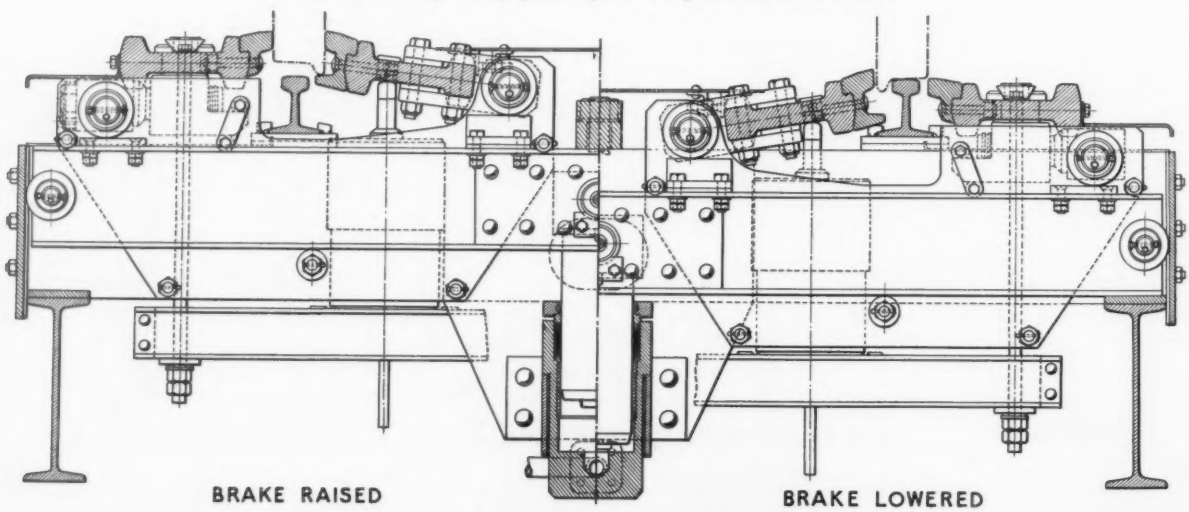


Fig. 11. Cross section of railbrakes

Railbrakes

Four hydraulic railbrake sets are installed one in each of the leads to the four main fans of sorting sidings between the " Queen " and " Jack " points. These brakes which are each 62 ft. long are of the Frölich type and a cross section is reproduced as Fig. 11, which illustrates how the brake-rails on each side of the running rails grip the wagon wheels at pressures determined by the operator of the brake levers in the control tower, who applies the appropriate amount of hydraulic power according to his observation of the speed of running of individual wagons or cuts of wagons down the falling gradient from the hump and the distance they are required to travel into the sorting sidings.

Illumination

An essential requirement in connection with mechanised yard working is ample illumination of the yard, and adequate electric lighting has been provided.

Toton is liable to fogs, and the experience of the L.M.S.R. Company elsewhere is that under fog conditions " local " lighting is more efficient than " flood " lighting, hence floodlights at high elevation have not been provided, except at the east side of the yard where adequate space for a sufficient number of lighting poles is impracticable. To overcome this a 100-ft. pylon has been erected carrying four 1,000-watt floodlights suitably directioned. This pylon is also equipped with lights about 25 ft. from ground level, which can be switched on in fog.

Spot lights adjacent to the hump room are provided to illuminate the chalked siding numbers on the wagons, and to assist the operator in determining the separation between cuts. A special feature is the provision of dwarf lights fitted with large reflectors at the west side of the railbrakes for use in fog only, to enable the brake and point operators in the control tower to see the dark forms of the wagons as they pass through the railbrakes during mist or fog. Control of lights in the hump area is exercised from the hump room and of the yard lights from the control tower.

Loud-Speaker Communication

The successful development by the L.M.S.R. of the use of loud-speaker equipment in recent years, not only at passenger stations but at marshalling yards, convinced the management of the utility of incorporating a loud-speaker system as an adjunct to mechanisation at Toton.

Loud-speaker circuits with two-way communication are provided between the following points:—

(i) Toton East Junction Signal Box — and — Hump Room
(ii) Hump Room — and — Control Tower
(iii) Control Tower — and — Outside positions in Yard

Item (i) is used in connection with the working of incoming trains, hump engine run round and other running movements.

Item (ii) permits of the closest collaboration between the hump room and control tower staff, the announcement by the former of commencement of humping, the passage of non-retarder wagons and exceptional loads, light engine movements to the motive power depot, &c. It also constitutes a reserve means of transmitting siding numbers from the hump room to the control tower in emergency.

Item (iii) enables information to be transmitted rapidly to the outside staff in the yard, which consists of a few shunters employed for exceptional purposes such as dealing with non-retarder wagons, special loads, brake-vans, vehicles with binding brake blocks, dropped hand brake levers, cleaning track circuits, &c., and with engines engaged in closing roads down. Microphones located in convenient positions outside enable these men to communicate quickly with the control tower staff in the event of difficulty or any special requirements.

The loud-speaker amplifiers are housed in the hump and control tower relay rooms.

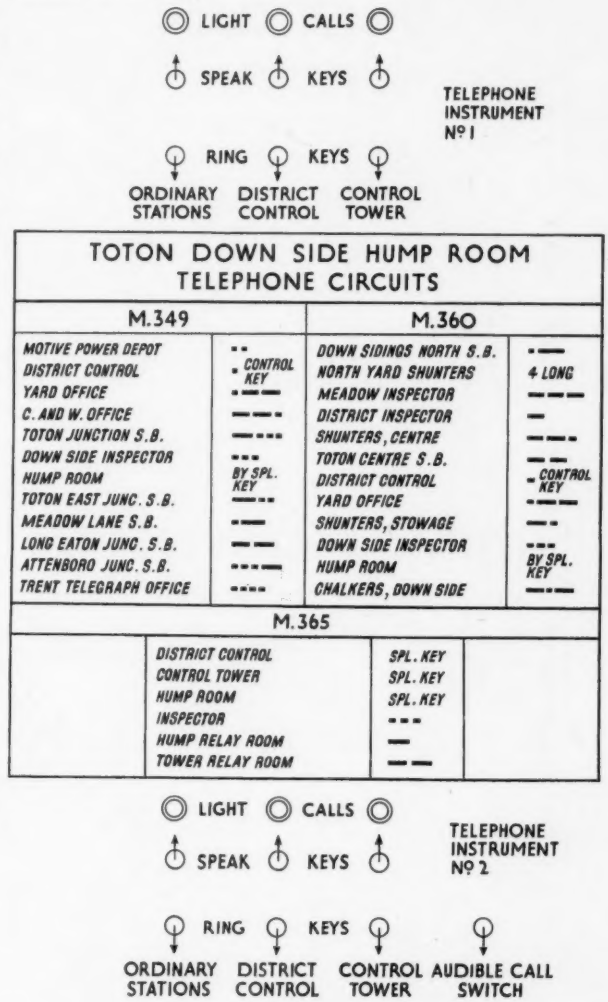


Fig. 12. Diagram of telephone panel in hump room

Telephone Communication

The yard was previously equipped with omnibus telephone circuits giving communication between the various essential points and the facilities necessary under mechanisation were transferred from the former cabins to the hump room and inspector's office. A new independent circuit was, however, provided between the following key points:—

District Control office
Control tower
Hump room
Inspector's office
Hump relay room
Tower relay room

LMS COPY

RECORD OF HUMP SHUNTING, TOTON DOWN SIDE

E.R.O. 52915

Weather Fine and warm

Turn of duty { ~~6 a.m. — 2 p.m.~~ / 2 p.m. — 10 p.m. / ~~10 p.m. — 6 a.m.~~ } Mon day

Date 3rd July 1939

TRAIN				HUMP SHUNTING									
Train	Time arrived	Time train engine liberated	Arrival line E. or W.	Time signal given to start humping	Time first wagon over hump	Time last vehicle over hump	No. of Wagons	No. of cuts	No. of non-retarders	Hump Engine No. or Target No.	Time left hump	To
7·42 am ex Wellingboro	-(Cont'd.)		West			2/9	35	22		7082	2/9	Low Level
Ex Low Level	2/0		East	2/9	2/15	2/23	55	33		708H	2/23	Yard - 20 Rd.
7·42 ex Kettering	2/30	2/33	W	2/33	2/35	2/48	78	25		7082	2/49	L.L.
Ex L. Level	2/42		E	2/49	2/51	3/0	53	28		708H	3/0	"
8·40 ex Wellingboro	2/48	2/49	W	3/4	3/6	3/19	78	40		7082	3/19	"
Ex L. Level	3/7		E	3/19	3/23	3/32	56	32		708H	3/32	"
Ex Up Side	3/34	3/45	W	3/34	3/36	3/45	29	18	1	3753	3/45	19 Rd.
Ex L. Level	3/38		E	3/45	3/48	3/58	57	40		7082	3/58	L.L.
2/55 ex Beeston	3/59	4/0	W	4/3	4/6	4/17	69	43		708H	4/17	"
Ex L. Level	4/6		E	4/17	4/19	4/29	59	30		7082	4/29	"
8·40 ex Willesden	4/16	4/17	W	4/33	4/36	4/46	63	43		708H	4/46	Yard - 20 Rd.
2·20 ex Brent	4/46	4/48	W	4/48	4/51	5/8	90	58		7082	5/8	L.L.
12/1 ex Rowsley	5/10	5/40	W	5/30	5/33	5/40	28	19		3079	5/40	"
12/10 ex Holwell	5/40	5/42	W	6/4	6/7	6/20	75	48		7082	6/20	18 Rd.
Ex L. Level	5/42		E	5/42	5/45	5/59	62	42		708H	5/59	Yard - No 1 Rd
Ex 18 Rd. Corys.	6/27		E	6/27	6/30	6/44	67	36		7082	6/44	L.L.
1/4 ex Northampton	6/20	6/22	W	6/44	6/47	7/1	80	33		708H	7/1	Yard - 6 & 9 Rds
12/35 ex Peterboro'	7/1	7/2	W	7/2	7/5	7/21	69	49		7082	7/21	L.L.
Ex Up Side	7/11	7/35	E	7/22	7/26	7/35	45	31		708H	7/35	Yard - 2 Rd.
Ex No. 2. Various	7/43		E	7/43	7/45	7/55	60	45		708H	7/55	Toton East
2/4 ex Peterboro	7/21	7/22	W	7/55	7/58	8/7	48	25		7082	8/7	L.L.
12/35 ex Willesden	8/6	8/7	W	8/7	8/10	8/17	45	25		708H	8/17	"
Ex L. Level	8/14		E	8/17	8/20	8/28	36	25		7082	8/28	Toton East
" " "	8/32		E	8/32	8/35	8/44	48	23		708H	8/44	" "
1/53 ex Wellingboro	8/24	8/30	W	8/44	8/46	8/57	59	28		7082	8/57	" "
8/8 ex Beeston	8/57	8/58	W	8/58	9/0	9/10	56	32		708H	9/11	Yard - 26 Rd
6/30 ex Knighton	9/10	9/11	W	9/17	9/19	9/31	80	43		7082	9/31	" 20 & 23 Rds.
Ex L. Level	9/25		E	9/31	9/33	9/45	53	23		708H	9/45	L.L.
" " "	9/55		E	9/55	(Cont'd)	-	-	-		-		

Shunting Engines :-
7082 - No. 15
708H - No. 16

HOURLY SUMMARY			
Time From	Time To	Cuts	Wagons
2	3	108	221
3	4	130	220
4	5	145	236
5	6	90	135
6	7	117	222
7	8	125	174
8	9	126	236
9	10	98	189
TOTAL HUMPED		939	1633

Complete trains:—

GRAND TOTAL WAGONS 1633

REMARKS

2/23 - 2/31 Ballast movements
5/10 - 5/30 Meals
6/20 - 6/27 Drawing Corys (DH)
7/35 - 7/43 Drawing No. 2 Rd.
9/45 - 9/55 Waiting

(Signed) G. W. Lings

Fig. 13. Specimen of daily humping record

In the case of the hump room a small modern keyboard has been installed alongside the signalling, route-setting and cut indication panels. Two hand-combination telephones are hung underneath the panel so that two separate circuits can be in use at the same time, if necessary. A diagram of the telephone panel is given in Fig. 12, from which it will be seen that either visual or audible means is available for incoming calls in the hump room.

Motive Power

The L.M.S.R. Company has a considerably larger fleet of diesel engines for marshalling yard work than any other railway company in Great Britain, and it is not surprising that these units have been introduced at Toton, since they have been found very suitable for hump shunting. The opportunity has been taken concurrently with the commencement of mechanised working at Toton to place in service the first batch of a new series of diesel-electric locomotives.

It is not proposed in this article to describe the units in detail, as they were described and illustrated in the Diesel Railway Traction Supplement in our August 4 issue. They combine the most up-to-date features learned from practical experience. They are of 350 h.p. and carry sufficient fuel oil to cover a week's continuous working without having to return to the motive power depot between weekends.

An important feature incorporated for the first time in this batch of diesel-electric locomotives is a precision speedometer to enable accurate speeds to be adhered to for humping purposes. This speedometer registers fractional speeds up to 2 m.p.h., whilst in addition there is an ordinary speedometer giving speeds up to 20 m.p.h.—the maximum light running capacity of the unit.

Humping Speeds

Humping speed at Toton Down side is a matter of considerable importance, particularly under " mechanised " yard working conditions, as a rhythmic speed of propulsion over the hump is conducive to more even separation of the cuts of wagons, whilst the speed must be as high as practicable in order to enable the traffic to be dealt with promptly. At the same time the speed must not be so high as to exceed the capacity of the automatic point storage and track circuiting system.

Although as yet sufficient time has not elapsed for studying humping speeds in all weather conditions under mechanised working at Toton, for " humping normal " a speed of approximately 1·75 m.p.h. is being observed for the time being with a speed of 1·25 m.p.h. for " humping slow "—the latter being only resorted to as a temporary check or in the event of abnormal conditions arising temporarily. The hump engine drivers find the precision speedometer with markings up to 2 m.p.h. of considerable assistance in conforming to the desired speed.

Non-Retarder Wagons

A minority of wagons has tyres secured to the wheel centres by nuts and bolts. These wagons are detected on the arrival lines and suitably marked for the guidance of the operator in the hump room. They are humped singly unless forming part of a composite load, and are not braked in the retarders. A hand brake is pinned down at the hump and the wagons allowed to run forward. The average number of such wagons passing over Toton Down side hump is 1 or 2 a thousand. A separate button on the hump room panel is depressed for these wagons, and indicates them on the moving paper cut list in the tower by means of a star.

Concrete Kerbs

From the hump down through the point area concrete kerbs have been laid just beyond the ends of the sleepers. Within the kerbs the ballast consists of light coloured granite chippings, with ordinary ash ballast outside. Apart from the suitability of the granite chippings in the point area, particularly where there are track circuits, its light coloured nature forms a better background for vision from the control tower since the darker forms of wagons are thrown up in more marked contrast, particularly under conditions of indifferent visibility.

Metal covers are fixed over the rail chairs outside each of the sorting sidings at the clearance point. These are painted white and assist the staff in determining at a distance whether wagons are standing foul of another road.

Records Kept

Fig. 13 gives an illustration of the form which is used for recording humping operations—a separate sheet for each turn of duty, and the form is entered up currently in the hump room.

As will be seen, the principal items recorded are:—

Train
Time of arrival
Time engine liberated
Arrival line humped off
Time humping signal given
Time first wagon over hump
Time last wagon over hump
Where hump engine sent
Number of wagons on train
Number of cuts on train
Number of non-retarders

with an hourly summary and a space for remarks in which are shown all items of special importance, and an explanation of large amounts of standing or non-humping time.

The record is made out in triplicate, one copy being sent to the District Controller for scrutiny and record purposes (there is no separate yardmaster), one copy to the Divisional Superintendent of Operation at Derby and one to the Chief Operating Manager at Euston. The number of wagons on a train and the number of cuts are easily counted from the moving paper cut list in the control tower, and the operator in that room gives this information to the hump room over the loud speaker. The moving paper cut list is retained for a period for reference purposes if required.

Acknowledgments

The full measure of the results of the enterprise will not be felt until after a winter's experience. But already there is every indication that the results will justify the progressive measures for modernising taken by the L.M.S.R. Company at this important yard, primarily, we understand, through the foresight of Mr. E. J. H. Lemon, Vice-President, (Operating and Commercial). The yard will continue to function under the supervision, so far as operations are concerned, of Mr. H. Rudgard, Divisional Superintendent of Operation for the Midland Division, Derby, and Mr. T. H. Wakefield, District Controller, Toton.

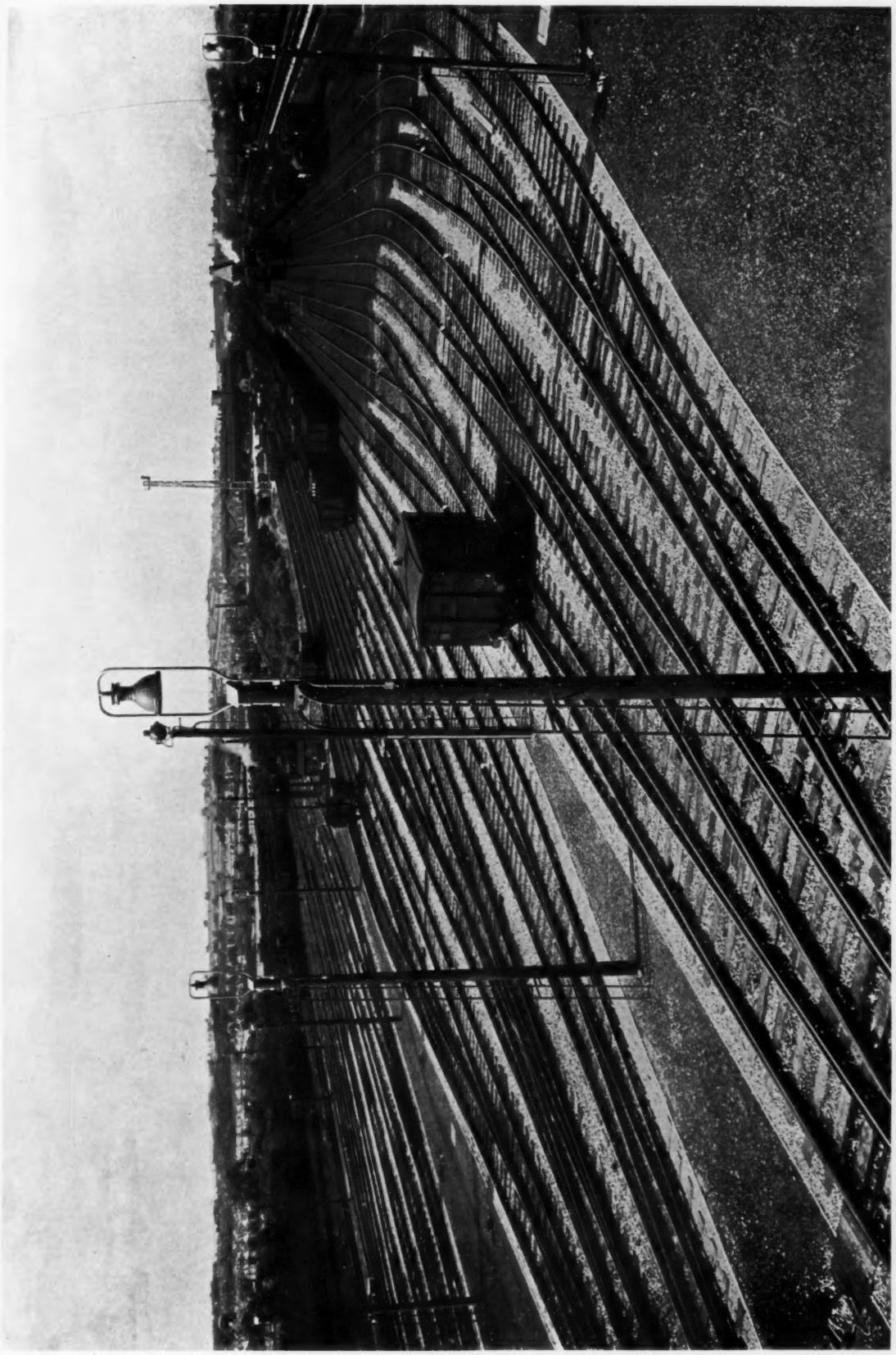
The engineering work in connection with the scheme was carried out to the requirements of the company's technical departments as under: Alterations to permanent way, construction of buildings, Mr. W. K. Wallace, Chief Civil Engineer; railbrakes, hydraulic machinery, &c., Mr. W. A. Stanier, Chief Mechanical Engineer; power working and control of points, cut indicating apparatus, signalling, &c., Mr. A. F. Bound, Signal and Telegraph Engineer.

It has been felt that a general description, mainly from the operating standpoint, will be of more interest to the main bulk of our readers at this stage than an attempt to incorporate the comprehensive technical and engineering details involved, and in connection with this our thanks are due to Mr. Ashton Davies, Vice-President, to whom we are indebted for permission to produce this article, and to Mr. T. W. Royle, Chief Operating Manager, for facilities afforded.

Entrance to High Level arrival lines (on left) from Toton East Junction, showing train entering West arrival line

Approach to hump showing train being humped off East arrival line

Colour-light running signal with bracket arm, and position-light humping signal



General view of sorting sidings from control tower

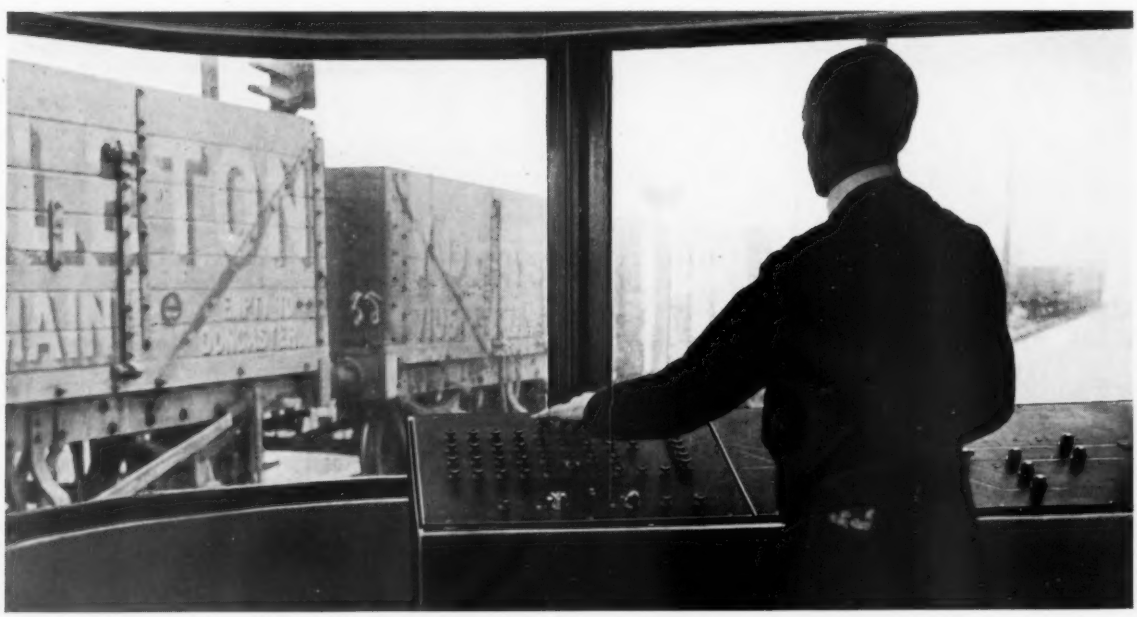
View of hump from High-Level arrival lines

Diesel-electric humping engine approaching hump

Hump room on left, humping line in centre, and (on right) drawing-up line from Low Level

Hump and hump room from north side

Cabinet and operating panels in hump room



View from interior of hump room showing operator working at panel

General view of sorting sidings from hump

View from control tower looking towards hump

View from control tower showing railbrakes

Close-up of wagon in railbrakes, showing also insulated rail joint and steel key

Exterior view of control tower

View from yard looking towards control tower and hump

Interior of control tower (top floor)

Brake operator's panel in control tower

Point operator's panel in control tower

Interior of control tower showing operators at brake and point panels

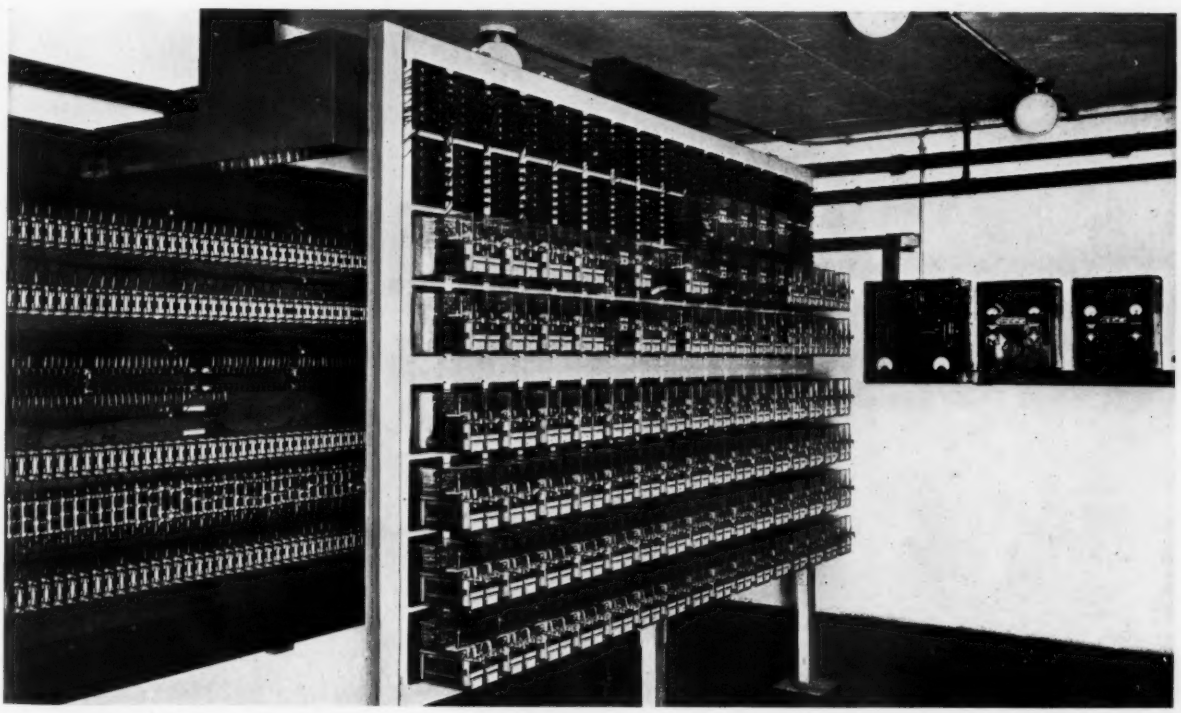
View of yard from control tower showing artificial lighting

View from control tower at night looking towards hump

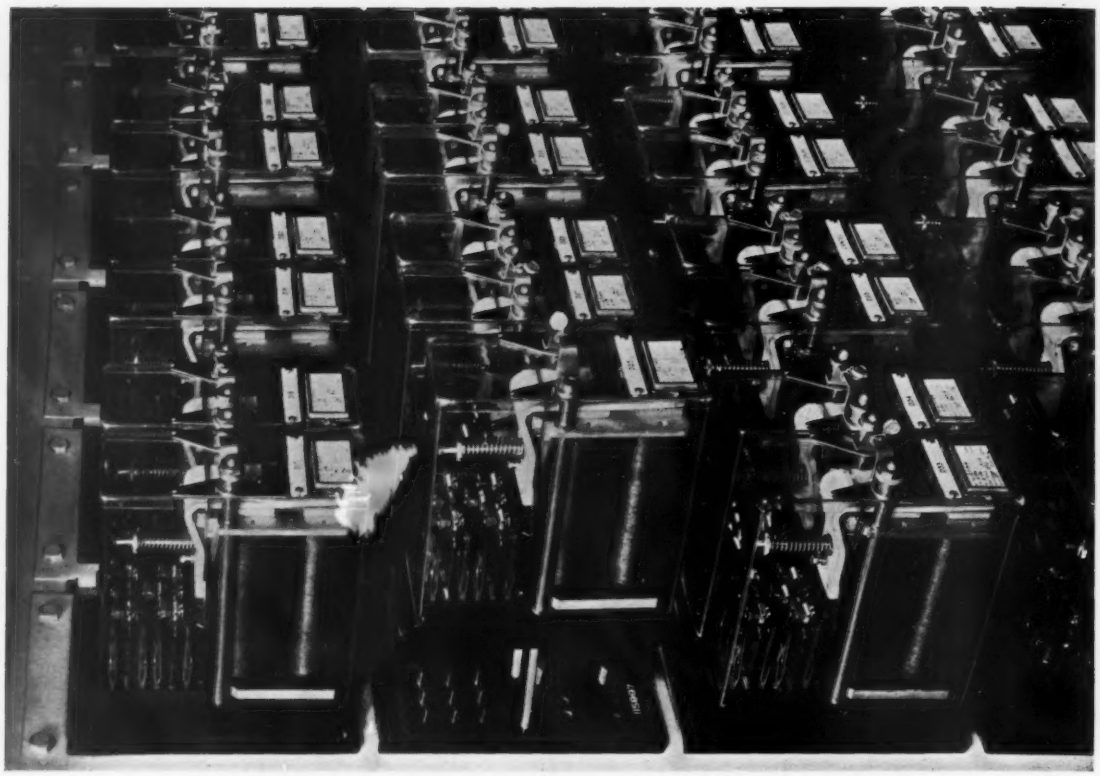
View from hump, showing yard illuminated

General view of yard by night

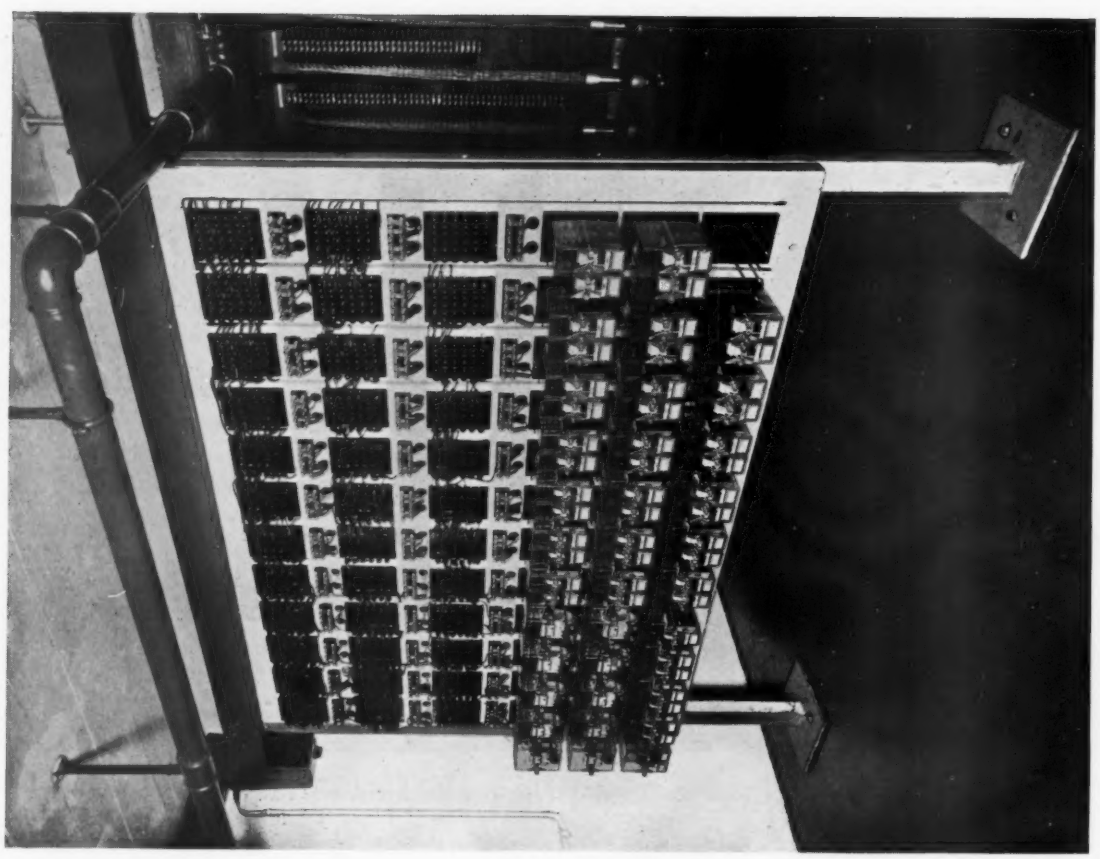
View across point area from control tower showing portion of wind screen



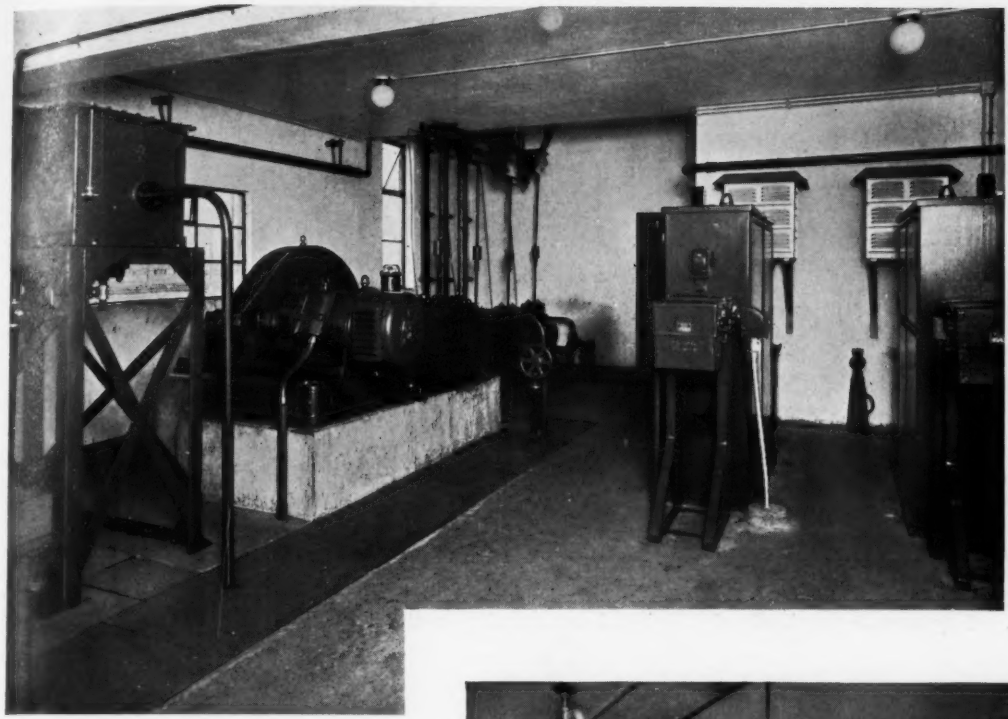
Tower relay room showing relay rack, terminal board, and rectifiers



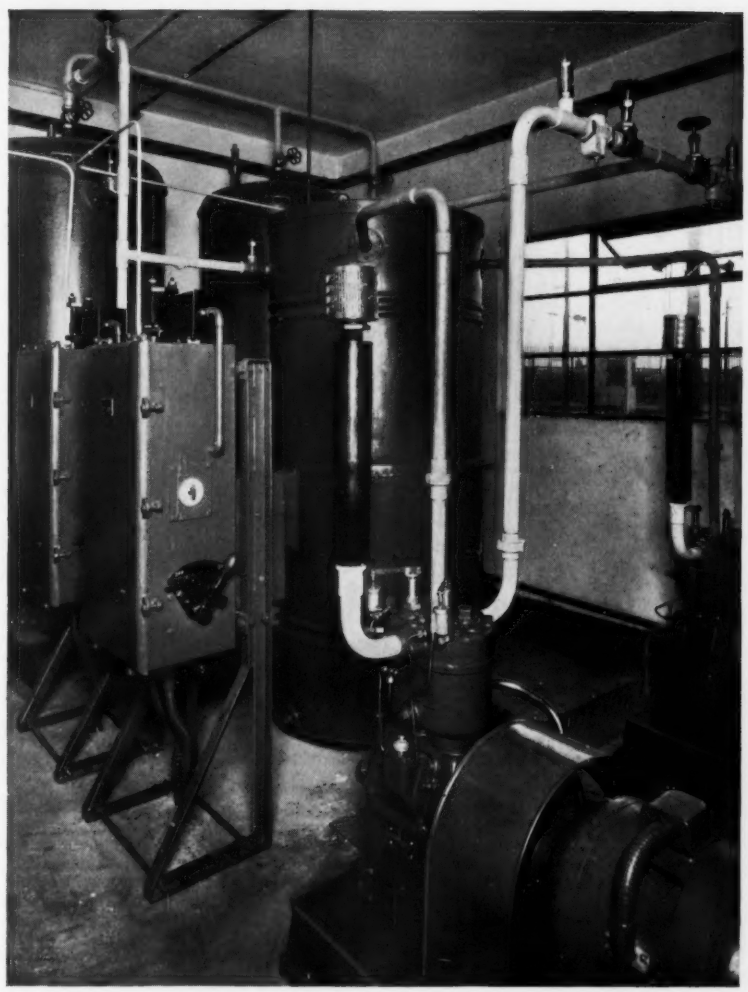
Tower relay room—Close-up of relays



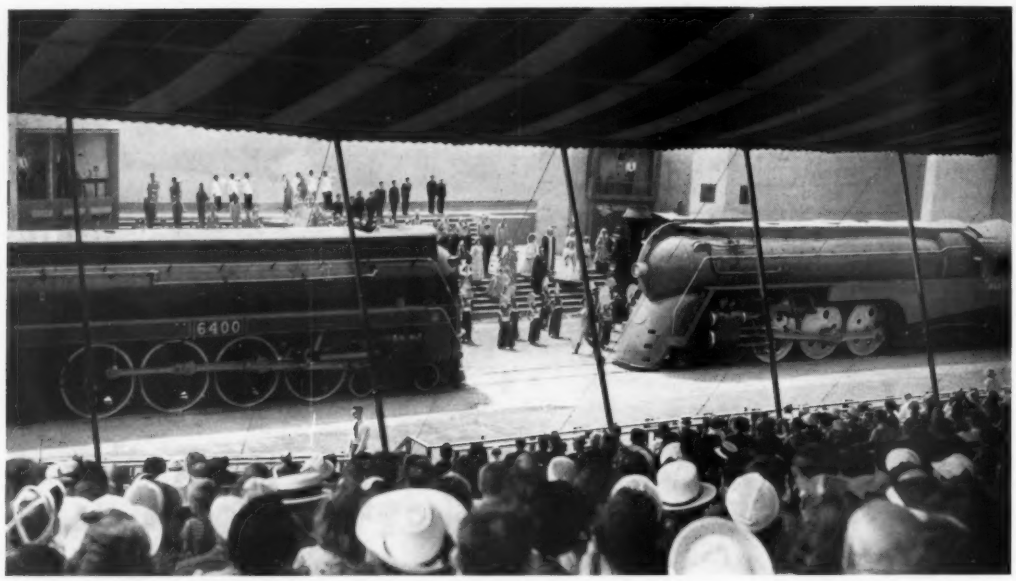
Hump relay room, showing relay rack



Hydraulic machinery room in control tower



View of compressor plant in control tower



The Canadian National (left) and New York Central (right) locomotives that hauled the Royal train, taking part in the finale of "Railroads on Parade" at the New York World's Fair

This station is on the four-line section of the London Passenger Transport Board railway which carries both District Line and Piccadilly Line trains. The fast lines, on which the latter run, are in the middle and terminate at Uxbridge. West of Acton Town station, the double line to Ealing Common (District Line) diverges northwards by a flying junction. There are also connections to the Acton depot. In the middle distance of the picture, the tracks are (left to right): Down Hounslow Slow and Ealing Common (crossover junction at the top of the straight incline), Down Ealing Common, Down Hounslow Fast, Siding connecting with latter and next following, Up Hounslow Fast, Up Ealing Common, two depot lines, Up Hounslow Slow. District Line trains run to Hounslow and Ealing Broadway, and those of the Piccadilly tube to Hounslow and Uxbridge; the Ealing Broadway and Uxbridge trains use the same tracks till their routes diverge at a flat junction north of Ealing Common The tube trains run on the fast, and the District on the slow, lines

View looking west from Acton Town, L.P.T.B.

RAILWAY NEWS SECTION

PERSONAL

Mr. Edgar Uzzell has been appointed Welfare Officer, Southern Railway, in succession to Mr. E. A. Richards, who has retired.

Mr. Gilbert S. Szlumper, General Manager of the Southern Railway, recently presented gold tokens to 43 members of the company's staff who have seen 50 years' service. The ceremony took place in the Staff Dining Club at Waterloo station. Mr. Szlumper recalled that this was the sixteenth presentation of its kind; in all 817 awards have now been made, of which 426 have gone to the Traffic Department, 191 to the C.M.E. Department, and 101 to the Locomotive Running Department.

Lord Ashfield, Chairman of the London Passenger Transport Board, is to be President of the Advertising Association for 1940, in succession to Sir Harold Bellman.

We regret to record the death in a motor accident on August 13, at the age of 27, of M. Jean Bugatti. With his father, M. Ettore Bugatti, he had taken an important part in the development of railcars and made a special study of bodywork and streamlining. For some years he had been Manager of the Bugatti works at Molsheim.

As a consequence of the retirement on October 1 next of Mr. W. H. Watson, Birmingham Agent of the Port of London Authority, the authority has revised arrangements for representation in the provinces with regard to shipping traffic to and from London. Mr. P. J. Fossey, of the Dock & Traffic Manager's Department, has been appointed Provincial Representative.

Mr. A. J. Lee, M.I.Mech.Eng., M.I.Loco.Eng., Chief Mechanical Engineer, Great Western Railway of Brazil, has recently arrived in England, and will be accompanying the Institution of Mechanical Engineers' party which is visiting the United States and Canada.

We regret to record the sudden death on August 12 of Mr. C. R. Peacock, Assistant Mineral Manager of the L.N.E.R. Mr. Peacock began his railway career with the former North Eastern Railway, and transferred to the Great Central Railway in 1898. With the latter company he occupied numerous positions on the goods side in London, Bradford, Staveley, Rotherham, and Sheffield. In 1920 he was appointed Chief General Manager of the South Yorkshire Navigation Company, which position he held for nearly five years. Mr. Peacock was then placed in charge of the L.N.E.R. Mineral Department at Chesterfield, and in 1928 went to Doncaster as Assistant Mineral Manager.

Institution of Mechanical Engineers

Summer Meeting in U.S.A.

Mr. W. A. Stanier, Chief Mechanical Engineer, L.M.S.R., is leaving tomorrow, August 19, for New York by the Cunard White Star ms. *Georgic* from Southampton. On September 6 he will read a paper at the Joint Session of the American Society of Mechanical Engineers and the Institution of Mechanical Engineers, at their summer meeting. The title of the paper is "Lightweight Passenger Rolling Stock." The party of members of the Institution of Mechanical Engineers and their friends attending the American summer meeting will leave Southampton on August 26 in the Cunard White Star R.M.S. *Samaria*. Other papers to be read are:—

"Motor Transport," by E. C. Ottaway, Technical Officer (Buses & Coaches), London Passenger Transport Board, A.M.I.Mech.E.

"Mechanical Engineering Problems in Marine Transport," by Sterry B. Freeman, C.B.E., M.Eng., M.I.Mech.E. (Member of Council).

"Transatlantic Air Transport with Particular Reference to Flying Boats," by A. Gouge, B.Sc.

The following is a list of those who have signified their intention of attending the summer meeting in America of the Institution of Mechanical Engineers:—

President

Mr. E. Bruce Ball, and Mrs. Bruce Ball (Kilmarnock).

Vice-Presidents

Mr. H. L. Guy, D.Sc., F.R.S., and Mrs. Guy (Manchester).

Mr. W. A. Stanier, and Mrs. Stanier (London).

Members of Council

Mr. Sterry B. Freeman, C.B.E., M.Eng. (Liverpool).

Mr. F. C. Lea, Emeritus Professor, O.B.E., D.Sc. (Sheffield).

Secretary

Mr. J. E. Montgomrey, B.Sc.(Eng.), (London).

Members

A. L. Bird, M.A. (Cambridge), H. M. Brack (Birmingham), Prof. S. J. Davies, D.Sc. and Mrs. Davies (London), Bernard H. Brown (Newcastle), James Clayton and Mr. E. J. Portley (Torquay), Thos. B. Collins and Mrs. Collins (Belfast), C. W. Bate Crossley (London), J. S. Daniels (Stroud), Colonel C. E. and Mrs. Davies (New York), Walter P. F. Fanghanel (London), James Finney (Birmingham), C. Norman Fletcher (Manchester), Henry Gardner (Kilmarnock), Frederick Grover (Leeds), Arthur Hackett (Birmingham), Benjamin Handley and Mrs. Handley and Mrs. B. Knight (Portsmouth), A. E. Higgs (Bristol), J. E. Hobbs and Mr. Peter Hobbs (Purley, Surrey), A. J. Lee and Mrs. Lee (Pernambuco, Brazil), W. D'Arcy Madden and Mrs. Madden (Bolton), James Mitchell and Mrs. Mitchell (Leicester), E. W. Moss (London), A. Bryant Symons, Mrs. Bryant Symons, Miss Joan M. and Miss Kathleen J. Symons (London), Francis Tipler, Mrs. Tipler, and Miss Margaret Tipler (London), Julian S. Tritton and Mrs. Tritton (London), Rex Wailes (London), G. Ethelbert Wolstenholme and Mrs. Wolstenholme (Sheffield).

Associate Members

Joseph Adamson and Mrs. Adamson (Hyde), Casimir Akerman, LL.D., B.Sc.(Eng.) (Bucharest), Donald Balmain and Mrs. Balmain (Dunston, Co. Durham), Max Bentham, M.Sc. (Cheadle Heath), H. A. Boultbee (Pontypridd), A. H. Chilton (London), J. L. Daniels and Mrs. Daniels (Stroud), Colin C. Day, M.A., and Miss Edith C. Day (Stockport), J. A. Dixon, M. J. P. Estler, B.Sc.(Eng.) (Surbiton), H. T. Fradley (Dublin), J. C. Hinson (Leicester), Walter Kay, B.Sc.Tech., and Mrs. Kay (Watford), Joseph Langston (London), S. Donald Lawson and Mrs. Lawson (Hampton, Middlesex), E. C. Ottaway (London), B. W. Pendred (London), S. J. Perry and Mrs. Perry (Leicester), F. B. Robinson, B.A., and Mrs. Robinson (London), F. H. Robinson and Mrs. Robinson (Cambridge), F. S. Sharp and Mrs. Sharp (Ipswich), P. L. Turner and Mrs. Turner (Wolverhampton).

Graduates

W. H. Darlington (Manchester), H. G. B. Knight (Horsham), G. B. Robinson (Birmingham), H. J. Webb, B.Sc.Tech. (Bury).

Student

I. S. Khalaf (Loughborough).

Prospective Members

A. E. Bibby, Mrs. Bibby, and Miss E. C. Bibby (Rochester), Norman Burke (London), Arthur Gouge, Mrs. Gouge, Mr. J. A. Gouge, and Miss M. K. Gouge (Rochester), David Robinson (Dudley).

Institution Staff

Frank W. White (Purley, Surrey).

Mr. Ernest Hartford, Assistant Secretary, American Society of Mechanical Engineers, will also accompany the party.

RAILWAY LAW FOR THE QUARTER

Railway Tribunals

While the question of statutory regulation of railways is under consideration, attention might well be drawn to the multiplicity of tribunals before which proceedings by or against railway companies and applications in general for legal pronouncements upon railway matters have to be brought. Actions at common law, or under Statutes such as the Fatal Accidents Acts or the Highways Acts, still come before the Kings Bench Division of the High Court. The High Court can also issue a writ of mandamus against a railway company for the maintenance of the line. But applications by traders and others for reasonable facilities, or complaints as to " undue preference " in rates, go before the Railway & Canal Commission now presided over by Mr. Justice Wrottesley.

The Railway Rates Tribunal appointed under the Railways Act of 1921 took over the functions of the Railway & Canal Commission as regards classification of merchandise and alteration of rates, terminal services and charges. The tribunal here consists of three members, one of whom is versed in commercial affairs, the second in railway business, and the third, who presides, must be an experienced lawyer. Appeals lie to the Court of Appeal on questions of law.

Finally the Railways (Valuation for Rating Act) 1930 created a new body—the Railway Assessment Authority, and a corresponding body for the Scottish railway companies, to value for rating purposes. Appeals from this body lie to the Railway & Canal Commission.

If alterations are to be made in the law affecting railways, it is surely time that the work of the Railway & Canal Commission and the Railway Rates Tribunal be amalgamated and questions of the right of appeal considered. It is also desirable to accelerate the hearing of short points on railway matters which do not brook of delay.

Railways and Road Repairs

Swain v. *Southern Railway Co.* (1939) *W.N.* 225.

The liability of a railway company for accident resulting from failure to repair a road, where such a duty exists, was discussed by the Court of Appeal (affirming Mr. Justice Humphreys) in the above case. In this case, as may be remembered, a cyclist was thrown to the ground and injured owing to potholes in a road over a bridge which it was the company's duty to keep in repair. The damage was caused by non-feasance and not by misfeasance, and it is long established that road surveyors and their successors, the municipal corporations, are not liable for non-feasance but only for misfeasance—in other words for acts of commission and not of omission. The exemption is unsatisfactory and seems illogical, but it exists, and the question was whether it extends to other bodies upon whom the burden of road repairs falls, as being the successors of the road surveyors. The Court of Appeal held that as the liability of the railway company arises only by Statute (the Railways Clauses Act 1845, S. 46) and is not a general responsibility for the repair of the roads, the exemption for non-feasance does not extend to them.

The exemption originally applied to the inhabitants at large and has no application, said the Court of Appeal, to companies carrying on business for profit, such as the Southern Railway Company. A further question of general interest was whether a railway company can plead in its defence the Public Authorities Protection Act, 1893, which provides that actions against public authorities for negligence must be brought within a period of six months. Here again the Court held that railway companies, although public duties are laid upon them by Parliament, are not in the position of public authorities, being in fact commercial companies working for profit. Finally the Court also affirmed Mr. Justice Humphreys in laying down the rule that the standard of repair required for the road was that it must be maintained in a condition suitable for the traffic which existed in 1856, when the particular private Act imposing this liability upon the Southern Railway Company was passed.

Walking Along Railway Line

Noble v. *Southern Railway Company*. (1939) 2 *A.E.R.* 817.

The appeal of the workman in this compensation case was dismissed, having regard to the decision in *Clarke* v. *Southern Railway Co.* (1927) 96 L.J. (K.B.) 572. But that case is not regarded as satisfactory law and there is to be a further appeal by Noble to the House of Lords. Indeed Lord Justice MacKinnon said " If by a happy catastrophe the vast mass of reported cases had been wholly destroyed, and I could approach this as a question of the construction of these sections " (as to accidents arising out of and in the course of the employment) " I should be of opinion that this appeal should succeed." The deceased, a fireman in the company's employment, had reported for duty at the engine shed and was walking along the line to board the train which was to take him to East Croydon where his night's work began. He had gone about a hundred yards when he was knocked down and killed by a passing train. It is true that a notice to the staff warned men not to walk on the line unless by a permitted route, and upon this ground the company denied liability for compensation. But, as against that, the Workmen's Compensation Act, 1925, sect. 1 (2), says that an accident resulting in the death of a workman is to be deemed to arise " out of and in the course of " his employment although he was acting against orders, provided that the act was for the purpose of and in connection with the employer's business. Upon this section one would at once jump to the conclusion that the claim for compensation must succeed. But the decision in *Clarke* v. *Southern Railway Co.* (*supra*) where the facts were precisely similar is to the contrary effect, and upon this decision the Court of Appeal dismissed the claim in *Noble's Case*.

It will be observed that the case is easily distinguishable from *Knowles* v. *Southern Railway Co.* (1937) A.C. 463, in which the workman had gone off the directed route for purposes of his own —namely to get a drink at a public house. But both in *Clarke's case* and *Noble's case* the workman was strictly on the company's business at the time of the accident, and it will be interesting to see what the House of Lords has to say of Lord Justice MacKinnon's and Lord Justice Luxmoore's criticisms, when the case reaches them.

Ticket Exempting " All Risk "

Beaumont Thomas v. *Blue Star Line Limited*. " *The Times*," *May* 26.

When the defendants, a shipping company, issued tickets for a cruise in their vessel, the *Arandora Star*, exempting themselves from " all risks whatsoever of the passage " they no doubt thought they were free from any possible liability for accident or negligence. The plaintiff, a passenger and ticket-holder, slipped on the wet floor of the ship's corridor, which was being washed down during the voyage, and sustained permanent injury to his leg. In an action for damages stress was laid upon the terms of the succeeding condition which " without restricting the generality " of the previous condition expressly excepted the company in case of " unseaworthiness or unfitness of the ship or machinery," &c.

The Lord Chief Justice held that the exemption referred only to marine risk, and that the ship steward was negligent in his washing of the alley way. He awarded the plaintiff £6,000 damages. The Court of Appeal set aside this judgment on the ground, first, that the exemption clause was quite unrestricted and required the passenger for his own protection to insure himself; and, secondly, that there was no negligence on the part of the steward in washing the corridor or in not warning passengers of the wet floor. The duty of the common carrier of passengers, unlike a common carrier of goods, is only to use due skill and care, and he is not in the position of an insurer.

Increase in Fares

Amalgamated Railway Companies and the L.P.T.B. Traffic Cases 1939, *p.* 167.

The deficiency of net revenue of the L.P.T.B. in the amount required to pay the standard dividend on the " C "

Stock for the year ended June 30, 1938, was £360,874. It would have been more had the board not been able to release £230,000 from income tax reserve. The estimated deficiency for this last year, according to Mr. Frank Pick, was £700,000. The increase of fares by 5 per cent. should make up this deficit and enable the proper dividends to be paid on this stock. The Railway Rates Tribunal in its considered judgment interpreted the Act of 1933 as imposing a duty on the board, if its revenue proved insufficient to defray statutory charges, to apply to the tribunal for authority to increase fares. The tribunal did not regard hardship upon the individual as sufficient ground for refusing to make the order, which applies also to the amalgamated companies where operating in the London area.

Two of the "objections" to the proposal are worthy of mention. The first was that as the L.P.T.B. Act, 1933, section 39, sub-s. 14, enables holders of "C" stock to appoint a receiver only in the event of the board failing to pay dividend on the stock for three consecutive years at the standard rate, the board should over-appropriate for two years to renewal reserve and withhold the dividend, and then under-appropriate in the third year to enable the dividend to be paid. The other objector thought that the renewal reserve was excessive and that s. 46 sub-s. 1, did not require the charges there mentioned (*a* to *g*) to be paid out of revenue. The tribunal did not accept this construction in either case. Generally the tribunal agreed that the net revenue of each of the companies was unduly low and that there was nothing to suggest any lack of economy in management.

STAFF AND LABOUR MATTERS

Railway Wages

The general managers of the four main-line railway companies met representatives of the Associated Society of Locomotive Engineers & Firemen at 11.0 a.m. on Thursday, August 10, when further negotiations took place in connection with the claims of the society for improved rates of pay and conditions of service. Sir James Milne, General Manager, G.W.R., presided, and the other companies were represented by Sir William V. Wood, Vice-President, L.M.S.R., Mr. C. H. Newton, Chief General Manager, L.N.E.R., and Mr. Gilbert S. Szlumper, General Manager, Southern Railway. At the conclusion of the meeting an official statement was issued in the following terms:—"Mr. Squance, on behalf of the society, amplified the statements contained in the previous correspondence and the meeting was adjourned until next week to enable the companies to give the matter further consideration."

In the afternoon the general managers met representatives of the National Union of Railwaymen and of the Railway Clerks' Association presumably to explain the position to them and at the close of the meeting the following announcement was issued: "The general managers of the four main-line railway companies met representatives of the National Union of Railwaymen and of the Railway Clerks' Association in London today, and after discussion the meeting was adjourned until next week."

A special delegate conference of the National Union of Railwaymen met in London on Friday, August 11, to consider the position arising out of the decision of the railway companies to raise the minimum rate of pay to 45s. a week. The conference lasted all day and the following resolution was adopted: "We note the companies have established the 45s. base rate. We, therefore, instruct the executive committee immediately to press the companies for a 50s. minimum adult base rate at the meeting, which has been arranged for Monday next, and report the result of the negotiations to a special general meeting at the earliest possible date."

In a statement after the conference, Mr. John Marchbank, General Secretary of the National Union of Railwaymen, said: "Very strong feeling was shown at the refusal of the companies up to date to concede what in the opinion of the delegates was a reasonable as well as a modest demand. Attention was drawn to the fact that all other claims had been dropped in favour of the 50s. minimum, particularly having regard to the unfortunate position of the lower-paid grades in the service. This decision does not prevent the further special delegate conference from taking any action it may decide on to enforce the claim in the event of the 50s. minimum not being conceded. At the moment the N.U.R. is completely uncommitted to any definite action pending a further meeting with the companies."

The adjourned meeting between the general managers of the four companies and the National Union of Railwaymen and the Railway Clerks' Association took place on Monday, August 14, and at the close of the meeting the following official announcement was issued: "The general managers of the four main-line railway companies met representatives of the National Union of Railwaymen and the Railway Clerks' Association in London today, when further discussions took place in connection with the claim of the National Union of Railwaymen for a 50s. minimum wage. The companies intimated that their present financial position did not justify any further increase in the minimum rate of 45s., which had recently been conceded."

It is understood that the National Union of Railwaymen is recalling the special delegate conference at an early date to consider the matter.

A further meeting between the general managers and representatives of the Associated Society of Locomotive Engineers and Firemen took place on Wednesday, August 16, and the following announcement was made at the close of the meeting. "The general managers of the four main-line railway companies met representatives of the Associated Society of Locomotive Engineers & Firemen on Wednesday, August 16, following the meeting on August 10, at which the society had urged further consideration of its claims for improved rates of pay and conditions of service. The companies intimated that, in granting the increase in the minimum rate of the lowest paid men, they had made the maximum concession which they considered could be justified in their present financial position. In these circumstances, they informed the society they had no alternative but to decline the application put forward by them. The companies suggested that if the society desired to pursue its claims in regard to rates of pay, holidays, Sunday duty, and hours of duty, it should refer them to the Railway Staff National Tribunal for consideration in the light of the altered conditions of today. If the society decided to adopt this course the companies would be prepared to do everything possible to expedite a hearing. The A.S.L.E.F. pointed out that it was in order in continuing the present method of negotiations, inasmuch as its claims have been previously argued through the Machinery of Negotiations and Clauses 18 and 19 of Memorandum of Agreement, dated February 26, 1935, are now operative."

Parliamentary Notes

London Transport Bill

The Royal Assent was given on July 28 to the London Passenger Transport Board Act, 1939.

Forthcoming Events

Aug. 18-20.—Institution of Railway Signal Engineers, at Nottingham. Summer Meeting.

Aug. 19 (*Sat.*).—Stephenson Locomotive Society (London), 10 a.m. Visit to Crewe Works, L.M.S.R.

August 26 (*Sat.*).—Institutions of Civil and Mechanical Engineers. Visit to United States and Canada.

Sept. 2 (*Sat.*).—Permanent Way Institution (Manchester-Liverpool), at Southport. "The Cheshire Lines," by Mr. K. Marrian.

Sept. 5-8.—Institute of Metals, at Glasgow. Annual Autumn Meeting.

NOTES AND NEWS

Federated Malay States Railways Half-yearly Earnings.—The General Manager of the Federated Malay States Railways informs us that the total revenue of that system for the period January-June, 1939, was £802,752, as compared with £911,714 during the first half of 1938.

Derailment in Roumania.—It is reported from Bucharest that 15 persons were killed and 25 gravely injured when a passenger train was derailed in the station at Petroaia, South-west Roumania, on August 13. The accident is stated to have been caused by the moving of a switch while the train was passing.

Naval Review Crowds at Weymouth.—Weymouth station was called upon to bear an exceptional pressure of traffic after the King's review of the Reserve Fleet on August 10. At one time there was estimated to have been a crowd of 45,000 in the station yard, and after 9 p.m. the station doors were locked after every train departure. There were many cases of fainting among the waiting crowds.

Closing Woodkirk Station.—The L.N.E.R. announces that Woodkirk station, between Leeds and Batley, will be closed from September 25. Parcels for conveyance by passenger train, and through wagon loads of merchandise, will be dealt with at Tingley, from which station the railway collection and delivery service will continue to operate in the Woodkirk district. Small consignments of goods traffic will, as now, be dealt with at Morley and delivered or collected from that station.

American Diesel Accident.—The 6,300-b.h.p. 17-car diesel luxury train *City of San Francisco*, operated between Chicago and San Francisco over the lines of the Chicago & North Western, Union Pacific, and Southern Pacific Railroads, was derailed on August 12, when running at speed near Carlin, Nevada, on the Southern Pacific section. Twenty-one persons are reported to have been killed and over 100 injured. Evidence is said to point to deliberate tampering with the track.

Northern Ireland Traffics.—Passengers (excluding season-ticket holders) carried on railways wholly in Northern Ireland during the first five months of 1939 numbered 1,575,270, compared with 1,626,694 in the corresponding period of 1938, but total passenger receipts rose from £84,087 to £84,950. Merchandise and minerals conveyed in the first five months of 1939 were 227,726 tons, an increase of 5,021 tons in comparison with the first five months of 1938; the number of livestock rose from 79,991 to 85,408, and the total goods traffic receipts from £83,706 to £83,833. On railways partly in Northern Ireland, the ordinary passengers in the first five months of 1939 were 1,759,099, against 1,724,765 in the first five months of 1938, and the total passenger receipts of £155,926 were £5,249 higher. Merchandise and mineral tons increased from 358,093 to 462,701, and the number of livestock from 253,753 to 290,750. Total receipts from goods traffic in the first five months of 1939 were £281,169, against £245,583 in the first five months of 1938.

British Association Meeting in Dundee.—The British Association for the Advancement of Science will hold its meeting this year in Dundee, from August 30 to September 6. Among the subjects to be discussed are education in industry, to which a contribution will be made by Mr. G. L. Darbyshire, Chief Officer for Labour and Establishment, L.M.S.R.; and aspects of industrial research, to be initiated by Mr. T. M. Herbert, Research Manager, L.M.S.R.

Exceptional Traffic at Newhaven.—Traffic to the Continent *via* Newhaven broke a 20-year record last week-end, and although three relief boats were provided on the morning service, some 220 travellers out of the 4,500 who arrived to make the crossing could not be accommodated. A certain number returned to Victoria and travelled *via* Folkestone, while others waited in Newhaven for the night or the next morning service. Difficulty was added to estimating the accommodation required on the steamers by the numbers of passengers who arrived at Newhaven by car.

Bridge Widening Under Traffic.—At Worship Street, just outside Liverpool Street station, L.N.E.R., the construction of a new widened bridge is taking place simultaneously with the demolition of the old one. Below, uninterrupted, run 1,264 trains a day, the busiest steam-operated train service in the world. Above, 4,000 telephone lines must be kept in use continuously. The work forms part of the L.N.E.R. electrification scheme to Shenfield, and over 400 tons of new steelwork and 70,000 rivets will be absorbed. At the same time 200 tons of steel and 400 tons of concrete embodied in the old bridge will be removed.

Signalling Improvements at Crewe, L.M.S.R.—The Crewe North Junction and Crewe South Junction signal boxes are to be rebuilt shortly by the L.M.S.R. At present the boxes stand at heights of 28 ft. and 22 ft. above rail level; they will be re-sited and considerably reduced in size. When the reconstruction is complete the existing electrically-operated semaphore signals will be replaced by the colour-light type, which, supplemented by route indicators (including the new standard junction type) will enable the present 274 signal arms to be reduced to 72 colour-light units. The junction indicators will be similar to those recently installed at Rugby. The new signalling will cover 3½ miles of the main line; the number of working levers will be considerably reduced in the new arrangement. The whole of the signalling alterations and reconstruction work is being carried out by the L.M.S.R. staff, with the minimum of interference with the daily operations at this busy centre.

Road Accidents.—The Ministry of Transport return for July of persons killed or injured in road accidents is as below. The figures in brackets are those for the corresponding period of last year:—

	Killed	Injured
England		
Pedestrians ...	181 (170)	5,027 (5,144)
Others ...	293 (291)	14,328 (14,067)
Wales		
Pedestrians ...	5 (12)	236 (249)
Others ...	20 (20)	608 (671)
Scotland		
Pedestrians ...	17 (24)	631 (639)
Others ...	38 (36)	1,300 (1,278)
	554 (553)	22,130 (22,988)

The total fatalities for the preceding month were 492, compared with 536 in the corresponding period of 1938.

Transport Exhibition at Cologne, 1940.—In our July 15, 1938, issue we announced that an international convention held in Paris had decided to hold an International Transport Exhibition at Cologne in 1940, under the presidency of Dr. Dorpmüller, German Minister of Transport and General Manager of the German State Railway. Dr. Dorpmüller has just issued a message in which he states the aim of the forthcoming exhibition as "to acquaint the experts as well as the general public of all countries . . . with the present high state of evolution of the various means of traffic and their interrelations." He extends a welcome to experts, manufacturers, scientists, and economists throughout the world, and hopes that they will "willingly and in large numbers follow the call for their co-operation."

Institution of Railway Signal Engineers: Summer Meeting at Nottingham.—The 19th annual summer meeting of the Institution of Railway Signal Engineers will begin to-day (August 18) at Nottingham and last until Sunday next, August 20, under the leadership of the President of the institution, Mr. James Boot, Signal Engineer, General Railway Signal Co. Ltd.; those proceeding from London will travel on the 10.0 a.m. train from Marylebone station, L.N.E.R. The headquarters for the meeting will be the Victoria Hotel, Nottingham. This afternoon (Friday) members will pay a visit to the Toton marshalling yard of the L.M.S.R. and inspect the newly-introduced signalling, point operation, and rail-brake working, fully described in the article on pages 233-259 in this issue. Tomorrow (Saturday) a whole-day motorcoach tour of the Dukeries and the Peak district will be made, and lunch taken at Buxton at the invitation of the General Railway Signal Company.

In the evening, there will be an official dinner and dance at the Victoria Hotel. On Sunday, a motor tour to places of interest in the city will be made, and the meeting will finish after lunch. The arrangements have been made by the Summer Meeting Committee, consisting of the President, Mr. Boot; Mr. H. W. Moore, Assistant Mechanical and Electrical Engineer and Signal Engineer, Northern Division, L.M.S.R. (Vice-President); Messrs. R. S. Griffiths, G. H. Crook, F. L. Castle, C. H. Hills, R. F. Morkill, and the Hon. Secretary of the Institution, Mr. M. G. Tweedie.

La Guaira & Caracas Railway.—Holders of the 5 per cent. debenture stock of the La Guaira & Caracas Railway Co. Ltd. agreed on August 10 to extend the moratorium for a further period not exceeding three years and to the suspension of interest on arrears of interest as from September next. Mr. J. A. Goudge, in the course of his address at the meeting, said that during the last two years there had been a remarkable improvement, due mainly to the drastic reduction in expenses and to the fact that the Venezuelan exchange had been greatly in favour of sterling. In normal circumstances, and always provided that exchange kept up at its present level, it was reasonable to look forward to earning somewhere near 4 per cent. on the debenture stock.

Evening Classes in Transport.—The 1939-40 session of evening classes in transport at the North-Western Polytechnic, Prince of Wales Road, N.W.5, reopens for enrolment on September 18. Classes will be held in preparation for the examinations of the Institute of Transport and those for the road transport certificates of the Royal Society of Arts. There are also courses in travel organisation for the examinations of the Institute of Travel Agents. Further particulars may be obtained from the Head of the Department of Commerce at the school, Mr. M. W. Mitchell. Special arrangements are made to enable members of London Transport staff who work in shifts to make up for missed lectures.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 32nd Week			Totals to Date		
	1939	1938	Inc. or Dec.	1939	1938	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,828 mls.)						
Passenger-train traffic	840,000	701,000	+ 139,000	16,674,000	16,949,000	− 275,000
Merchandise, &c.	384,000	395,000	− 11,000	14,983,000	14,456,000	+ 527,000
Coal and coke	170,000	224,000	− 54,000	8,442,000	8,006,000	+ 436,000
Goods-train traffic	554,000	619,000	− 65,000	23,425,000	22,462,000	+ 963,000
Total receipts	1,394,000	1,320,000	+ 74,000	40,099,000	39,411,000	+ 688,000
L.N.E.R. (6,320 mls.)						
Passenger-train traffic	541,000	465,000	+ 76,000	10,792,000	10,871,000	− 79,000
Merchandise, &c.	263,000	272,000	− 9,000	10,259,000	10,188,000	+ 71,000
Coal and coke	192,000	219,000	− 27,000	8,000,000	7,544,000	+ 456,000
Goods-train traffic	455,000	491,000	− 36,000	18,259,000	17,732,000	+ 527,000
Total receipts	996,000	956,000	+ 40,000	29,051,000	28,603,000	+ 448,000
G.W.R. (3,737¾ mls.)						
Passenger-train traffic	365,000	302,000	+ 63,000	7,066,000	7,103,000	− 37,000
Merchandise, &c.	136,000	161,000	− 25,000	6,405,000	5,894,000	+ 511,000
Coal and coke	54,000	97,000	− 43,000	3,572,000	3,433,000	+ 139,000
Goods-train traffic	190,000	258,000	− 68,000	9,977,000	9,327,000	+ 650,000
Total receipts	555,000	560,000	− 5,000	17,043,000	16,430,000	+ 613,000
S.R. (2,142 mls.)						
Passenger-train traffic	517,000	434,000	+ 83,000	10,609,000	10,593,000	+ 16,000
Merchandise, &c.	52,500	56,000	− 3,500	1,967,500	1,920,500	+ 47,000
Coal and coke	23,500	26,000	− 2,500	1,017,500	965,500	+ 52,000
Goods-train traffic	76,000	82,000	− 6,000	2,985,000	2,886,000	+ 99,000
Total receipts	593,000	516,000	+ 77,000	13,594,000	13,479,000	+ 115,000
Liverpool Overhead (6½ mls.)	1,813	1,523	+ 290	45,180	44,176	+ 1,004
Mersey (4½ mls.)	4,671	4,121	+ 550	143,680	140,796	+ 2,884
*London Passenger Transport Board	569,100	526,200	+ 42,900	3,496,100	3,360,700	+ 135,400
IRELAND						
Belfast & C.D. (80 mls.) pass.	4,786	4,761	+ 25	84,464	82,161	+ 2,303
,, ,, goods	454	437	+ 17	13,915	13,698	+ 217
,, ,, total	5,240	5,198	+ 42	98,379	95,859	+ 2,520
Great Northern (543 mls.) pass.	23,150	17,300	+ 5,850	355,050	346,750	+ 8,300
,, ,, goods	8,600	9,300	− 700	320,950	281,200	+ 39,750
,, ,, total	31,750	26,600	+ 5,150	676,000	627,950	+ 48,050
Great Southern (2,076 mls.) pass.	65,693	55,481	+ 10,212	1,148,795	1,153,537	− 4,742
,, ,, goods	31,243	38,495	− 7,252	1,280,740	1,241,373	+ 39,367
,, ,, total	96,936	93,976	+ 2,960	2,429,535	2,394,910	+ 34,625

* 6th Week (before pooling) August Bank Holiday Week, 1939

British and Irish Railway Stocks and Shares

Stocks	Highest 1938	Lowest 1938	Prices Aug. 16, 1939	Prices Rise / Fall
G.W.R.				
Cons. Ord.	65¼	25¾	29½	−1
5% Con. Prefce.	118¾	74	86*	−1½
5% Red.Pref.(1950)	111¾	90	94½*	—
4% Deb.	111	97½	97½	—
4½% Deb.	112 5/16	100½	100	—
4½% Deb.	118½	104	105	—
5% Deb.	131½	119	114½	—
2½% Deb.	69¾	60	59	—
5% Rt. Charge	129	114	110½	—
5% Cons. Guar.	128½	103	104½*	−1
L.M.S.R.				
Ord.	30½	11	13	—
4% Prefce. (1923)	70¼	23	39½	−½
4% Prefce.	82¼	43¾	55*	−1½
5% Red.Pref.(1955)	103½	66	79	+½
4% Deb.	105 15/16	85	91½	—
5% Red.Deb.(1952)	114¼	105	106½	−½
4% Guar.	102¾	77½	79½*	—
L.N.E.R.				
5% Pref. Ord.	8 9/16	3½	4¼	−¼
Def. Ord.	4 7/16	2 1/16	2⅞	—
4% First Prefce.	68¼	21	32½	−1
4% Second Prefce.	27¼	8	11	−½
5% Red.Pref.(1955)	97	40¼	49½	−1
4% First Guar.	97½	66¼	67½*	−3
4% Second Guar.	91¼	52	59*	−2½
3% Deb.	79¼	60	61	−½
4% Deb.	104⅛	77	81½	−1
5% Red.Deb.(1947)	110⅝	97	103½	—
4½% Sinking Fund Red. Deb.	108 11/16	101	98	—
SOUTHERN				
Pref. Ord.	87	47¼	62*	−1
Def. Ord.	21¾	9¼	13	—
5% Pref.	115	83	88*	−2½
5% Red.Pref.(1964)	115½	98	99½*	—
5% Guar. Prefce.	128½	106	107½*	—
5% Red.Guar.Pref. (1957)	116	108½	106½*	—
4% Deb.	109¼	95	97½	—
5% Deb.	129	117	114½	+½
4% Red. Deb. 1962-67	107	101½	103	+½
BELFAST & C.D.				
Ord.	4	3½	4	—
FORTH BRIDGE				
4% Deb.	102	99⅛	92½	—
4% Guar.	103¼	94½	87½	−1½
G. NORTHERN (IRELAND)				
Ord.	5½	2½	4	—
G. SOUTHERN (IRELAND)				
Ord.	25½	8½	9½	—
Prefce.	35	13	10½	—
Guar.	70¼	30 15/32	26½	—
Deb.	83	56	47	—
L.P.T.B.				
4½% "A"	119 5/8	107½	106½	—
5% "A"	130	117	113½	−1
4½% "T.F.A."	108	98	103	+½
5% "B"	122 13/16	105	105½	—
"C"	84	68	70½	−1
MERSEY				
Ord.	24¼	16½	22	—
4% Perp. Deb.	102⅞	94¾	90	—
3% Perp. Deb.	77	69	65½	—
3% Perp. Prefce.	66½	57	52½	—

* ex dividend

CONTRACTS AND TENDERS

Metropolitan Railcars (Ganz Patents) Limited has received an order from the Argentine State Railways for 10 triple-car diesel-mechanical trains and seven single-unit diesel railcars for operation on metre-gauge lines. The value of the order is about £295,000, and the complete vehicles will be built at the Budapest works of Ganz & Co. This order brings the total of Ganz diesel vehicles on the Argentine State Railways to 143 in service or on order.

George Wimpey & Co. Ltd. has received a contract from the London Passenger Transport Board for the demolition of the present Central Line station at Wood Lane, and its replacement by a station to be built about 300 yd. away, opposite the main entrance to the White City Stadium. The new station will have two island platforms, and a ticket hall facing on Wood Lane.

Converters for G.W.R.

The British Thomson-Houston Co. Ltd. has received an order from the Great Western Railway for converting equipment to augment the supply to the electric line between Paddington and Hammersmith. The order comprises five air-cooled steel tank rectifiers of 1,500 kW. capacity each, with tuned smoothing circuits, associated a.c. and d.c. switchgear and twelve track feeder equipments. The rectifiers will be installed in two existing sub-stations where they will replace some very old motor converters. They will operate 6-phase with transformer primary windings alternately star and delta connected and taking a supply at 6,600 volts 3-phase 50 cycles from the London Power Company.

Brecknell Munro & Rogers (1928) Limited has received an order from London Transport for a further 50 combined ticket-and-change-giving machines for installation at selected Underground stations. These are for tickets ranging from 7d. to 10d., giving change for a shilling or two shillings. The total number of combined ticket-and-change giving machines in use when this batch has been delivered will be 276. Piccadilly and Oxford Circus stations will then have a complete range of ticket-and-change machines from 1d. to 10d. Next month at Hounslow West and Northfields 8d. and 9d. machines will be installed, and at South Harrow there will be machines ranging from 7d. to 10d. for the first time, and at Ealing Common 7d. and 8d. machines.

Head, Wrightson & Co. Ltd. has received the official order for a special type of lift bridge for the Irish Free State. The novel design upon which the contract is based is the result of some years of research by Head, Wrightson technicians. The first bridge of this kind to be manufactured by Head, Wrightson was a small experimental bridge erected in South America some years ago.

In recent weeks Head, Wrightson has also secured orders for equipment for steel works and non-ferrous industries from France, Turkey, Sweden, Holland, and Poland. This follows the company's intensive policy of extending its export markets. It is stressed that none of these orders is for armaments, but for ordinary commercial development.

Sigmund Pumps (Gt. Britain) Limited, of Gateshead-on-Tyne, has received a contract from the Great Western Railway Company in connection with its A.R.P. programme for 26 light trailer fire pumps with accessories. The supplier's railway agent is Wm. Gilmour Smith & Co. Ltd., Glasgow and London.

The Morvi Railway Administration has placed orders for rolling stock and associated equipment, to be supplied to the inspection of Messrs. Robert White & Partners, with the following firms :—

Ateliers de La Dyle (Louvain) : 60 4-wheel wagons for salt traffic.
A.B.C. Coupler Engineering Co. Ltd. : 60 vehicle sets of MCA/PH type metre-gauge couplers.

The South Indian Railway has placed orders for equipment, to be supplied to the inspection of Messrs. Robert White & Partners, as follows :—

Steel, Peech & Tozer : 242 locomotives tyres, 160 carriage and wagon tyres.
Linley & Company : 27 flanged copper firebox plates.
I.C.I. Metals Limited : 8 tons of copper rods and tubes.

The Junagad State Railway has placed orders for equipment, to be supplied to the inspection of Messrs. Robert White & Partners, as follows :—

Muir & Findlay : 1 marine boiler, 6 ft. 4 in. dia. × 7 ft. 6 in. long.
Ibbotson Brothers : 84 helical and volute springs.
Smith Bros. & Hill : 166 helical springs.
Henricot's Steel Foundry Limited : 100 cast steel spring cases and hanger brackets.

Colvilles Limited has received an order from the Bhadnagar State Railway for the supply of 7½ tons of strip plates, to be supplied to the inspection of Messrs. Robert White & Partners.

The Bombay, Baroda & Central India Railway has placed orders for equipment, to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton, with the following firms :

Linley & Company : Copper plates.
Consolidated Brake & Engineering Co. Ltd. : Vacuum brake fittings.

John Lang & Sons Limited has received an order from the Madras & Southern Mahratta Railway for the supply of a lathe, to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

Jessop & Co. Ltd. has received orders from the Indian Stores Department for seven steel tender axles and a total of 275 steel tyres.

Machine Tools for India

H. W. Ward & Co. Ltd. has received an order from the Bengal & North Western Railway for a lathe, to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

Churchill Redman Limited has received an order from the Bengal-Dooars Railway for a sliding, surfacing, and screw-cutting lathe, to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

The North Western Railway Administration, India, is calling for tenders (Tender No. 210—8.18.22) for the supply and delivery of 20 locomotive boilers, superheated for "N" (2-10-0) class non-standard engines. Tenders, receivable up to September 18, should be addressed to the General Manager, North Western Railway, Lahore. A copy of the specification and general conditions of tender, together with drawings, may be inspected until tomorrow (Saturday), at the Department of Overseas Trade, after which the documents will become available for loan. A further copy is available for immediate loan. Copies of the drawings are also available for reference at the office of Hodges, Bennett & Co. Ltd., 16, Victoria Street, London, S.W.1.

L.M.S.R. Toton Down Marshalling Yard, Mechanisation Scheme

Regarding the article on pages 233-259, the following is a list of the contractors :—

Main Contractor to L.M.S.R.

Supply and installation of signalling, railbrakes, and point operating equipment	General Railway Signal Co. Ltd., Australia House, London, W.C.2.

Sub-Contractors to G.R.S. Co. Ltd.

Cables, &c.	Callenders Cable & Construction Co. Ltd.
Railbrakes	Francis Morton Limited, Garston.
Hydraulic equipment	Hy. Berry & Co., Leeds.
,, ,,	Hydraulic Coupling & Engineering Co. Ltd., Chester.

Contractors to L.M.S.R.

Reinforced concrete buildings	Sunley & Company, Keysign House, Oxford Street, W.1.
Heating	Wm. Freer Limited, Leicester.
Special lighting pylon	Geo. Sand & Sons, Nottingham.

Other Firms Supplying Equipment to L.M.S.R.

Compressors	Broom & Wade, High Wycombe.
Points and crossings	Taylor Bros. & Co. Ltd., Sandiacre.
Loud speakers	Tannoy Products Limited, West Norwood.

OFFICIAL NOTICES

Crown Agents for the Colonies

COLONIAL GOVERNMENT APPOINTMENTS.

APPLICATIONS from qualified candidates are invited for the following posts:—

M.8555. ASSISTANT TRAFFIC OFFICER required for the Nigerian Government Railway for two tours each of 12-24 months with possible permanency. Salary £400 a year, rising to £840 a year. Free passages and quarters and liberal leave on full salary. Candidates, age 25-35, must have matriculated or obtained School Leaving Certificate exempting from matriculation; must have had railway experience in the United Kingdom or Colonies, in the commercial, goods and rates branch of the Traffic Department; must be fully conversant with both the theory and practice of railway rates and charges, and have had experience of their application in road and rail competition, "Agreed Charges" and "Contract Rates." They must have had a good knowledge of operating and commercial subjects in general railway and motor road services, and be capable of supervising African and European Staff. Preference will be given to candidates who are Associate Members of the Institute of Transport or have taken a University degree in either economics or commerce.

M.8834. ASSISTANT LOCOMOTIVE RUNNING SUPERINTENDENT required by the Palestine Railway for two tours of 18 to 24 months' residential service with possible permanency. Salary £P300 a year, rising to £P550 a year, plus expatriation allowance of £P50 a year and a temporary and variable cost of living allowance at present fixed at the rate of £P48 a year (£P1 equals £1). The initial salary will be fixed in the scale according to the qualifications and experience of the candidate selected. Free passages. Candidates, preferably unmarried, age 30-40, must have served a pupilage or a full apprenticeship in the Locomotive Workshops of a British Railway, and must be Associate Members of the Institution of Civil or Mechanical Engineers, or hold an engineering degree or diploma exempting them from passing the qualifying examination for such membership.

Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting the reference number against the appointment for which application is made.

THE owners of Patent No. 392,050, which relates to Guards for Crossing Highways and Railway Level Crossings, wish to enter into negotiations either for the grant of licences or for the sale of the patent. Enquiries should be addressed in the first place to: ANDREWS & BYRNE, 329, High Holborn, London, W.C.1.

Universal Directory of Railway Officials and Railway Year Book

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33, Tothill Street, Westminster, S.W.1.

Indian State Railways

APPLICATIONS are invited for an appointment as Assistant Transportation Superintendent (Rolling Stock), Traction Branch, Great Indian Peninsula Railway.

Candidates must be British subjects and should be under 35 years of age and must possess a Science or Engineering degree of a recognised University or equivalent educational qualifications, and must have had good practical mechanical and electrical engineering workshop training and not less than five years' subsequent practical experience in a responsible post controlling the maintenance and operation of electric multiple unit trains and electric locomotives. A knowledge of general electric traction work is desirable.

Permanent appointment, subject to three years' probation. Pay: Rupees 675 plus £25 Overseas Pay a calendar month (equivalent approximately to £907 10s. 0d. p.a.), rising by biennial increments to Rs. 775 plus £25 Overseas Pay a calendar month (£997 10s. 0d. p.a.), with prospect of advancement to Rs. 850 plus £30 Overseas Pay a calendar month (£1,125 p.a.), rising after three years to Rs. 950 plus £30 Overseas Pay a calendar month (£1,215 p.a.), and ultimately to Rs. 1,300 plus £30 Overseas Pay a calendar month (£1,530 p.a.). Provident fund and gratuity. First class passage to India, and, if confirmed after probation, further passages for purposes of leave. (Overseas Pay and leave passages admissible only to appointee of non-Asiatic domicile.)

Further particulars and forms of application may be obtained on request by postcard (quoting appointment 1/30H), from the HIGH COMMISSIONER FOR INDIA, General Department, India House, Aldwych, London, W.C.2. Last date for receipt of applications 15th September, 1939.

The Southern Railway and Safe Driving Competition

Men from all areas enter this nation-wide competition, and last year 85 per cent. gained awards

In these days, when the question of safety on the roads is constantly before the public, the railway companies encourage members of their cartage staffs to enter the "Safe Driving" competitions held every year under the auspices of the National Safety First Association. The competition was inaugurated in 1917 and was at that time confined to drivers in the Metropolitan Area, but in 1928 it was made a national competition. Some of the Southern Railway carters in London have entered every year since 1917, and one of these qualified for a "star" bar in the 1938 competition, representing freedom from accident over a period of 21 years—a truly remarkable record which has been attained only by 18 other men throughout the whole country.

Up to 1935, entries from Southern Railway carters and drivers were confined to men employed in the London and suburban areas, but owing to the increasing interest in the safety first movement, entries from a few provincial stations were accepted for the 1936 competition, whilst in 1937 the scope was extended and entries invited from all cartage stations throughout the system. In the 1938 competition, 929 men were entered and 792 gained awards—a percentage of 85, which can be regarded as eminently satisfactory. The following is an analysis of the awards:—

Awards gained	For freedom from accident for:—
1 "star" bar ...	21 years
59 special bars ...	15 to 19 years
152 "oak leaf" bars	11 to 14 years
29 gold medals ...	10 years
128 silver bars ...	6 to 9 years
11 silver medals ...	5 years
412 diplomas... ...	1 to 4 years

Railway and Other Reports

North Central Wagon Co. Ltd.—A final dividend of 9 per cent. is recommended, again making 15 per cent. for the year ended June 30 last. Profit for the year, after providing for income tax, was £43,877, comparing with £47,593 for 1937-38.

Brazil Railway Company.—Holders of the 5 per cent. first mortgage 60-year variable income gold bonds (international series) are informed that the variable interest on the English issue for the year 1938 will be paid at the rate of ½ per cent. on August 17. A similar distribution was made for 1937.

Port of London Authority.—The tonnage of vessels using the Port of London fell from 62,646,000 in 1937 to 61,896,000 in 1938, a decline for which the international situation and the state of world trade may be blamed. Imported and exported goods in the year ended March 31 (the financial year of the authority) were lower in tonnage, 41,662,000 in 1938 against 44,644,000 in 1937. Despite this decline, the authority's surplus on revenue account shows an increase from £1,693,425 in 1937 to £1,759,031 in 1938; this may be attributed to economy measures, begun before the period under review, having their effect, and to the increase in rates as from the autumn of 1937. Revenue surplus and other income exceed interest and redemption fund charges and income tax by £259,398, of which £29,730 is taken by A.R.P. expenditure. Sums of £70,000 to the pension fund and £130,000 to the maintenance and renewal fund absorb most of the remainder. The amount carried to the general balance sheet is £370,637, against £340,969 brought in.

Cowans, Sheldon & Co. Ltd.—An increase in net profit from £42,285 for 1937-38 to £59,229 for the year ended June 30 last is reported. The dividend of 10 per cent is the same as for the previous year.

WOMAN ATTACKED IN L.N.E.R. EXPRESS.—A woman passenger in the L.N.E.R. Anglo-Scottish night express—the Highlandman—on August 11 was attacked by the only other occupant of her compartment when the train was near Aberlady, and her handbag, containing £7, was snatched from her. Her assailant was afterwards seen running down the corridor and appears to have leapt out of the express, his body being later found on the line at Aberlady, with the handbag still clutched in his hands. He was identified as Private Kingsmill, of the Royal Artillery, stationed at Edinburgh.

Railway Share Market

Bearing in mind the inactive and uncertain conditions which have ruled on the Stock Exchange, where sentiment was entirely dominated by the tension in international politics, home railway securities have shown a steadier tendency than might have been expected. The past week's traffic figures were in accord with best market estimates, but in view of surrounding market conditions and the disposition to await the outcome of the wages claims of the railwaymen, little speculative interest was shown in the junior stocks. Prior charge stocks were steady in most instances, but Great Western and Southern preference declined somewhat sharply. Owing to the very limited business in evidence in the stock markets, there has been a tendency for a small amount of selling to have a disproportionate influence on quotations for individual securities.

Southern preferred at 62 was within a point of the price current a week ago, while the deferred stock was fractionally higher at 13⅛, sentiment having benefited to some extent from the belief that passenger traffics should show an upward trend during the next few weeks if fine weather conditions continue. Southern 5 per cent. preference went back from 90½ to 88, but the 4 per cent. debentures were steady at 97½. L.M.S.R. 1923 preference failed to reflect the prevailing market view that the full 4 per cent. dividend is probably now being earned on this stock, but on balance for the week the price was little changed at 39⅛, compared with 40. On the other hand, the 4 per cent. preference was a point down at 55½. The ordinary stock was 13⅛, compared with 13⅜, and the 4 per cent. guaranteed 79½, compared with 80, while the 4 per cent. debentures were 91½. The £5,000 decline in the past week's traffics of the Great Western came as a disappointment, and the ordinary stock has moved down from 30½ to 29½, while the 5 per cent. preference reacted further to 86, and would appear to give an unduly generous yield. The 4 per cent. debentures, however, were again 97½. L.N.E.R. first preference at 32½ was within a point of the price current a week ago, and the second preference, which changed hands around 10¼, was fairly well maintained. On the other hand, the guaranteed stocks declined sharply, the first guaranteed from 70 to 68 and the second from 61 to 59½. Owing to the activity in the heavy industries, the traffic outlook of both the L.N.E.R. and L.M.S.R. continues to be viewed as excellent, but it can hardly be expected that the stocks of the main-line railways will respond until the surrounding tendency on the Stock Exchange is less uncertain and there is a removal of anxiety regarding the labour dispute. London Transport "C" was a firmer market, and, following a reaction to 70, the price improved to 70½, which is virtually the same as that ruling a week ago. Foreign railway securities were again very inactive. Central Argentine 4 per cent. debentures, however, received some attention, and the price rallied from 47½ to 50. B.A. Great Southern 4 per cent. debentures were firmer at 48½, as were B.A. Western 4 per cent. debentures at 41. The ordinary stocks of the leading Argentine railways showed fractional movements and the preference stocks were fairly steady. American railway shares were better, but Canadian Pacific were unresponsive to the view that, if traffics continue at their present rate, resumption of dividends may be possible for the current year.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1938-39	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1938	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1938	Prices: Lowest 1938	Prices: Aug. 16, 1939	Yield (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	13.8.39	10,150	– 9,760	32	409,370	502,900	– 93,530	Ord. Stk.	14	7¼	6	Nil
	Argentine North Eastern	753	12.8.39	10,943	– 428	7	69,416	73,902	– 4,486	,,	6½	2	3½	Nil
	Argentine Transandine	—	—	—	—	—	—	—	—	A. Deb.	82	75	62½	6⅜
	Bolivar	174	July 1939	4,200	+ 550	30	29,150	26,250	+ 2,900	6 p.c. Deb.	8	7	7	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	10	4	6¼	8
	Buenos Ayres & Pacific	2,801	12.8.39	78,846	+ 4,280	7	474,008	465,386	+ 8,622	Ord. Stk.	6½	3¼	3	Nil
	Buenos Ayres Central	190	22.7.39	$134,400	+ $22,900	4	$409,600	$405,200	+ $4,400	Mt. Deb.	15½	8	11	Nil
	Buenos Ayres Gt. Southern	5,082	12.8.39	119,665	– 7,816	7	729,653	790,509	– 60,856	Ord. Stk.	17⅝	8½	6¼	Nil
	Buenos Ayres Western	1,930	12.8.39	41,935	+ 1,799	7	261,229	242,058	+ 19,171	,,	12¾	5	5	Nil
	Central Argentine	3,700	12.8.39	131,405	+ 22,729	7	820,394	658,447	+ 161,947	,,	13¼	5¾	6	Nil
	Do	—	—	—	—	—	—	—	—	Dfd.	6	2½	2½	Nil
	Cent. Uruguay of M. Video	972	5.8.39	18,257	+ 1,514	6	89,783	92,010	– 2,224	Ord. Stk.	3	1¼	1	Nil
	Costa Rica	188	June 1939	25,240	– 6,129	52	270,756	314,399	– 43,643	Stk.	28	22½	22½	8⅞
	Dorada	70	July 1939	14,500	– 4,400	30	95,100	114,600	– 19,500	1 Mt. Db.	105¼	104	102½	5⅞
	Entre Rios	810	12.8.39	17,339	+ 571	7	109,218	100,545	+ 8,673	Ord. Stk.	7¼	3½	4	Nil
	Great Western of Brazil	1,092	12.8.39	5,000	– 300	32	260,200	211,900	+ 48,300	Ord. Sh.	3/-	1/-	¼	Nil
	International of Cl. Amer.	794	June 1939	$433,084	+ $7,473	26	$3,234,011	$3,010,488	+ $223,523	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	6d.	6d.	½	Nil
	La Guaira & Caracas	22¾	July 1939	6,490	+ 1,145	30	41,920	35,580	+ 6,340	Stk.	8	6½	7½	Nil
	Leopoldina	1 918	12.8.39	23,698	+ 786	32	624,937	614,055	+ 10,882	Ord. Stk.	4	1	1	Nil
	Mexican	783	7.8.39	$231,100	– $53,400	6	$1,476,300	$1,507,900	– $31,600	,,	¼	1/16	⅛	Nil
	Midland of Uruguay	19	July 1939	9,153	– 74	4	9,153	9,227	– 74	,,	⅞	½	½	Nil
	Nitrate	386	31.7.39	4,754	– 455	30	70,318	90,505	– 20,187	Ord. Sh.	52/9	19/16	13/4	7⅛
	Paraguay Central	274	12.8.39	$3,742,000	+ $852,000	7	$22,318,000	$21,538,000	+ $780,000	Pr. Li. Stk.	60	55½	40½	141⅜16
	Peruvian Corporation	1,059	July 1939	64,406	– 9,649	5	64,406	74,055	– 9,649	Pref.	5⅝	1⅜	1	Nil
	Salvador	100	5.8.39	¢14,000	+ ¢630	6	¢58,932	¢61,993	– ¢3,061	Pr. Li. Db.	23	20	19½	Nil
	San Paulo	153½	6.8.39	28,495	– 2,935	31	984,932	1,021,397	– 36,465	Ord. Stk.	64	28	21½	9⅝16
	Taltal	160	July 1939	1,555	– 1,955	5	1,555	3,510	– 1,955	Ord. Sh.	1⅜16	1/-	½	10
	United of Havana	1,353	12.8.39	15,325	– 875	7	97,518	102,414	– 4,896	Ord. Stk.	3⅝	½	3/4	Nil
	Uruguay Northern	73	July 1939	800	– 108	4	800	908	– 108	Deb. Stk.	2	1	2	Nil
Canada	Canadian National	23,762	7.8.39	681,114	+ 38,113	31	21,330,149	20,030,256	+ 1,299,893	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	— 4 p.c.	Perp. Dbs.	72	60	68½	5¹⁵⁄₁₆
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104	90	96½	4⅛
	Canadian Pacific	17,171	7.8.39	523,000	+ 12,000	31	15,216,000	14,986,600	+ 229,400	Ord. Stk.	8⅞16	4¼	4¼	Nil
India†	Assam Bengal	1,329	20.7.39	39,592	+ 666	16	429,913	416,803	+ 13,110	Ord. Stk.	81½	70	71½	4⅝16
	Barsi Light	202	31.7.39	4,762	+ 2,175	18	43,395	55,057	– 11,662	Ord. Sh.	60½	54¼	50½	5¹⁵⁄₁₆
	Bengal & North Western	2,112	31.7.39	64,822	– 6,276	18	913,644	1,007,222	– 93,578	Ord. Stk.	311	278	253	7⅛
	Bengal Dooars & Extension	161	31.7.39	4,314	– 237	18	36,966	44,295	– 7,329	,,	89	83	91½	7⅛
	Bengal-Nagpur	3,267	31.7.39	194,250	+ 23,785	18	2,596,577	2,386,011	+ 210,566	,,	95½	90	90½	4⅞16
	Bombay, Baroda & Cl. India	2,986	10.8.39	178,350	– 22,275	19	3,111,450	3,176,550	– 65,100	,,	112⅞16	95	104½	5⅝
	Madras & Southern Mahratta	2,967	31.7.39	153,150	+ 4,161	18	2,051,484	1,960,961	+ 90,523	,,	108	97	100½	7⅞16
	Rohilkund & Kumaon	546	31.7.39	10,941	– 2,671	18	183,731	205,122	– 21,391	,,	308	285	261	6⅞
	South Indian	2,531¾	20.7.39	111,973	+ 615	16	1,295,023	1,289,585	+ 5,438	,,	104	101	95½	5¼
Various	Beira	204	June 1939	83,026	—	40	719,357	—	—	—	—	—	—	—
	Egyptian Delta	623	20.7.39	5,505	+ 465	16	55,711	54,979	+ 732	Prf. Sh.	7⅛	5/6	1⅛	Nil
	Kenya & Uganda	1,625	May 1939	206,557	– 11,295	21	1,220,870	1,309,332	– 88,462	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	49	41	43	8⅛
	Midland of W. Australia	277	June 1939	11,544	– 4,418	52	177,307	180,121	– 2,814	Inc. Deb.	93¾	89	89	4⅛
	Nigerian	1,900	1.7.39	21,764	– 7,056	14	370,507	411,607	– 41,100	—	—	—	—	—
	Rhodesia	2,442¾	June 1939	365,928	—	40	3,246,158	—	—	—	—	—	—	—
	South Africa	13,284	22.7.39	654,504	+ 28,311	17	10,420,611	9,846,264	+ 574 347	—	—	—	—	—
	Victoria	4,774	May 1939	800,924	– 54,892	48	8,666,883	9,084,032	– 417,149	—	—	—	—	—

NOTE. Yields are based on the approximate current prices and are within a fraction of 1/16

† Receipts are calculated @ 1s. 6d. to the rupee.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being over estimated. The statements are based on the current rates of exchange and not on the par value